Railway Age

DAILY EDITION

FIRST HALF OF 1924. No. 28 NEW YORK—WEDNESDAY, JUNE 11, 1924—ATLANTIC CITY SIXTY-NINTH YEAR

Published weekly by Simmons-Boardman Pub. Co., 30 Church St., New York, N. Y. Subscription Price, U. S., Canada and Mexico, $6.00; foreign countries (excepting daily editions), $8.00, and $10.00 a year, including all dailies; single copies, 25 cents. Entered as second-class matter, January 30, 1918, at the post office at New York, N. Y., under the act of March 3, 1879.

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VOLUME 76 JUNE 11, 1924 NUMBER 28

PUBLISHED EVERY SATURDAY AND DAILY EIGHT TIMES IN JUNE BY THE
SIMMONS-BOARDMAN PUBLISHING COMPANY,
30 CHURCH STREET, NEW YORK

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CABLE ADDRESS: URASIGMEC, LONDON.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

Subscriptions including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, including daily editions published in March and June, $10. Foreign countries, not including daily editions, $8.00. Foreign subscriptions may be paid through our London office in £. s. d. Single copies, 25 cents each.

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Efficient committee work, particularly for a national organization, is a difficult proposition. The committee members should, of course, be selected because of their special qualifications for functioning on a given committee. The report, when it is completed, should be representative of all of the interests involved. Mechanical department officers are busy men and unless some special effort is made, a committee report is likely to be largely the work of one or two men. An extreme instance of this was a report presented a few years ago. It concerned one of the most important subjects for that particular year. The chairman did not even hold a meeting of the committee, but designated one of his subordinates to draft a report. At least one other member of the committee was particularly well fitted to participate in the initial work of outlining the scope and objectives of the report, and to help in its preparation; this because he not only could give considerable time to such work, and was well equipped to do so but also because his road—probably more than any other road in the country—had accumulated extensive and accurate data on the subject. He was surprised to receive a copy of the report in his mail one morning, with the request that he look it over and wire his approval immediately, so as not to delay printing and sending it out to the members. Certain statements and formulae did not check up with the data in his possession, which was based upon the most painstaking and comprehensive tests—and yet he had to wire his approval or hold up and delay the report, with the convention only a few weeks away. The work of the Mechanical Division is too important to the railroads, either individually or as a group, and is too far-reaching, to be carried on in this way. Fortunately, most committees take their assignments more seriously. It must be remembered, however, that the real worth and influence of the division depends primarily on the work of its committees and no effort should be spared to make that work as thorough, comprehensive and accurate as possible.

Making Good on Committees

Fusion welding, although relatively a new process, has been adopted by the railroads for both construction and repair work. The skepticism which accompanied its development has been largely dispelled. There remains, however, a need for the American Railway Association becoming more closely affiliated with activities in the welding field. Members of the association will undoubtedly be interested in the present activities of the American Welding Society. The American Engineering Standards Committee has authorized the formation of a section committee to prepare specifications for tubular steel poles which will become the American standard in this field. The American Electric Railway Association has upon invitation accepted sponsorship for this committee and the American Welding Society has been asked to appoint a representative and alternate on this committee. The Gas Products Association has suggested that the American Welding Society appoint an educational committee to cooperate with the Education Committee of the Gas Products Association. The American Welding Society, now in the fifth year of its existence, is the most active sponsor of the art of welding in this country and the railway associations can well afford to cooperate with it. A meeting of members of the American Welding Society attending the convention, has been planned for Monday, June 16, and members of the A. R. A. and R. S. M. A. are invited to attend. Suggestions for inter-association activities could be made at this time. Of special interest to R. S. M. A. members is the announcement that the American Welding Society will publish a membership directory in July or August. Most of the manufacturers of welding apparatus are already members of the society and those who are not will have an opportunity at the meeting on Monday to learn how to become members and of the advantages of so doing.

Of Interest to Welders

The conscious objective of all railroad men, irrespective of the department to which they belong, should be to provide maximum transportation service at a minimum cost. With this end in view, the mechanical and stores departments should co-operate to the fullest possible extent, and probably in most cases they do. It is questionable, however, if each always gives due consideration to the problems and perplexities of the

Mechanical and Stores Department Co-operation

other. Is each department always willing to accept its just share of the blame for delayed material and in general to submerge self-interest in the good of the railroad as a whole? The stores department can co-operate by perfecting an organization which, barring accident, will supply the needs of the mechanical department and prevent cars or locomotives from being held out of service waiting for material. The mechanical department can co-operate by advising the stores department of its needs a reasonable length of time in advance so that material can be obtained through the usual channels without the trouble and expense involved in sending wires and shipping by express. It is particularly important that the general storekeeper be informed whenever contemplated changes in equipment design will result in rendering certain material in the hands of the stores department obsolete and create a demad for other material not kept on hand. Railroad equipment is undergoing a continual change and improvement in design, which is justified by resultant savings, of which the cost of scrapping obsolete parts is probably a small proportion. If, however, the stores department is not notified of changes and these obsolete designs are carried in stock, unnecessary expense is involved, owing to storage space required, rehandling at inventory time and capital investment tied up. Moreover, certain materials, such as large locomotive castings, often are not received for several months after the requisition is placed. It is not unknown for the storts department to be receiving new material of this kind from the manufacturer some time after it has been made obsolete by changes in equipment design. It is also important to notify the stores department of new machinery installations, for certain parts of these machines may be needed in stock against possible breakage. When machines are retired or scrapped, the stores department should be informed, otherwise repair parts for these machines may be carried in stock long after there is any possibility of using them. The mechanical and stores departments officers who attend the conventions should return to their respective tasks determined more than ever before to work together for the interests of the railroads as a whole.

First Impressions

The exhibits generally were in place earlier than usual this year and the final task of getting the big pier in shape for the opening day was comparatively simple—thanks to the good work of the Exhibit Committee. There are several surprises this year for regular attendants at the conventions. The first one greets the visitor before he gets to the pier—the new building at the end of Arkansas Avenue, across the Boardwalk from the Million Dollar Pier, which houses several of the heavier exhibits; in a sense it may be classed as an expansion or annex to Machinery Hall. The Arkansas Avenue building is conveniently located and promises to be one of the most popular parts of the exhibit. The second surprise is the scheme of decoration. The spaces in the different sections of the exhibit are so great that to be effective the decorations must be planned on a large scale, and this involves more or less daring—those in charge took a chance this year and went at the job in a big way; the effect is quite remarkable. The third surprise is the extension of the Annex to include the space alongside of the southwest of Convention Hall. This adds a considerable amount to the floor space of the exhibit and houses a number of additional exhibitors. The building just beyond Convention Hall is utilized, as in past years, for the demonstrations of welding apparatus and different types of furnaces. Another striking feature of this year's exhibit is the large number of machine tools and the great amount of shop equipment which is exhibited on the pier and in the Arkansas Avenue Annex. The general effect of all of these innovations is quite startling and is an indication of the progress which is being made from convention to convention in enlarging and improving the exhibit. Possibly it would be more in keeping with the remarkable display to characterize it as an exposition; surely its educational value can be classed with that of other great expositions.

Are Railroad Men Ambitious?

One of the points brought out in the discussion of a paper on the methods of interesting and instructing railway employees in the maintenance of air brake equipment at the recent convention of the Air Brake Association at Montreal, was the difficulty encountered in getting many railroad men to study. A number of interesting points were brought up, practically all of which were based on the ancient inducement of either entertaining or feeding the otherwise unwilling student. It seems to be an element of human psychology, which was aptly defined by Lady Astor in a recent speech in the English Parliament, that many men want to get into the kingdom of heaven without praying and want the best in the world without paying. Of course, from the veiwpoint of the officers who have achieved their positions by extra effort and hard work, this is hard to understand, but nevertheless it has to be contended with. The fault, however, does not lie entirely with the officers who are trying to put an educational program across. There are many foremen who seem to be afraid that a man is trying to get their job if he asks a question about the work. Cases are known where a gang foreman has deliberately taken a man off of a job in which he appeared to be unusually interested and assigned him to a less interesting task. It does not take much of this kind of treatment to kill a man's interest in his work. If you are not getting the results that you think you should with your educational program it might be well to investigate the attitude of the gang foremen and those minor officers who have direct supervision over the men. The average railroad man has plenty of ambition and wants to get ahead, but neither the man nor the company can capitalize on personal ambition to the fullest extent without the co-operation of all the officers and foremen.

Optimism Regarding the Future

Although there has been a decline in railway gross and net earnings within recent months and also a decline in orders placed by the railways for equipment and supplies, it is notable that most of the railway men and railway supply men attending the conventions betray no symptoms of pessimism regarding the future. The moderate optimism they show appears t be based on solid grounds. While there has been a recession in general business recently, there is general agreement among financiers and economists that underlying conditions are sound, with the exception that agriculture in some important parts of the country continues to suffer from adversity. The decline in railway traffic which has occurred within recent months has been due mainly to an abnormal decline in shipments of coal, and there is strong reason for believing that with

shipments of coal restored to normal, as they are bound to be in a short time, the railways will handle as much freight business in the latter half of this year as they did in the latter half of last year. Railway operating costs are on a lower basis than a year ago and therefore traffic as heavy as that of last year would produce a larger net operating income. The orders placed by the railways for equipment and supplies are determined chiefly by the net returns being earned by them, and an increase in traffic and net operating income would almost certainly be followed by an increase in orders for equipment and supplies. The railway situation will also be favorably affected by the new tax legislation and by the adjournment of Congress without the passage of any of the numerous threatening bills that were introduced. The railway question is not settled. Undoubtedly it will be the subject of much discussion in this year's political campaign. The radical groups at their convention in Cleveland on July 4 undoubtedly will declare for government ownership of railways, and it seems probable that that proposed policy will be the subject of increasing controversy for some time to come. The deluge of protests against proposed radical railway legislation which was poured upon Congress during its recent session shows, however, that public sentiment regarding railway matters is more intelligent now than it has been for years. The outcome of the national election will have an effect upon future railway regulation, but the danger of radical legislation has now been removed for at least six months, and if the work of educating the public regarding railway matters is continued, it seems improbable that any radical railway legislation will be enacted at the next session of Congress. On the whole in spite of some bad features the railway situation is now the best it has been for years. The optimism being expressed by most railway officers and railway supply men is a recognition of this fact.

Is the Promise Fulfilled?

This year's program of the Mechanical Division presents a splendid picture of the improved efficiency of the modern steam locomotive and suggests that the future still holds many possibilities for further improvements. Many of the important improvements which are part of the modern locomotive have as their principal objective a decrease in the fuel consumption per unit of work, and the designs have been carefully developed, often on the basis of accurately made tests. When the design is complete, however, it quickly loses its individuality and becomes a hundred or more locomotives scattered over the railroad. Then, who knows whether these hundred locomotives, or any one of them, is actually giving the expected return in ton-miles for each pound of fuel burned? No one, unless there is a well organized fuel conservation department on the railroad, charged with the responsibility of seeing that each pound of coal does all the work that can be gotten out of it. The logic of the refined locomotive design with its possibilities of high fuel efficiency demands an equal degree of refinement in its use. This means thorough and insistent supervision which can only be obtained by an organization for that purpose. The ordinary locomotive, not particularly well proportioned, but always operated by the best methods, may do as well as one of the most refined design if the latter locomotive is operated with little attention to possible refinements in firing and handling practice.

Program for the Week

THE MEETINGS of Division V—Mechanical, American Railway Association, will be held in the Greek Temple on the Million Dollar Pier. The official headquarters of the Division, however, will be at the Marlborough-Blenheim Hotel. All of the convention sessions will open at 9:30 a.m., Daylight Saving Time. This is one hour faster than Eastern Standard Time.

Wednesday, June 11, 1924

9:30 a.m. to 12:30 p.m.

Meeting called to order.
Address by Chairman.
Address by R. H. Aishton, president, American Railway Association.
Action on minutes of annual meeting of 1923.
Appointment of Committees on Subjects, Resolutions, Correspondence, Obituaries, etc.
Unfinished business.
New business.
Report of General Committee.
Discussion of reports on:
Nominations.
Locomotive Design and Construction.

ENTERTAINMENT

10:30 a.m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.
3:30 p.m.—Orchestral Concert and Impromptu Dancing, Entrance Hall, Million Dollar Pier.
4:30 p.m.—Tea will be served in Entrance Hall.
9:00 p.m.—Informal Dance, including Special Features, Ball Room, Million Dollar Pier.

Thursday, June 12, 1924

9:30 a.m. to 12:30 p.m.

Discussion of reports on:
Shop and Engine Terminals.
Individual paper, "The Modern Locomotive," by W. H. Winterrowd, assistant to president, Lima Locomotive Works.
Individual paper, "Lehigh Valley Three-Cylinder Locomotive No. 5000," by J. G. Blunt, mechanical engineer, American Locomotive Company.
Individual paper, "Stresses in Track produced by Modern Locomotives," by C. T. Ripley, chief mechanical engineer, Atchison, Topeka & Santa Fe.

ENTERTAINMENT

10:30 a.m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.
3:30 p.m.—Orchestral Concert and Impromptu Dancing, Entrance Hall, Million Dollar Pier.
4:30 p.m.—Tea will be served in Entrance Hall.
9:30 p.m.—Grand Ball, Ball Room, Million Dollar Pier.

Friday, June 13, 1924

9:30 a.m. to 12:30 p.m.

Discussion of reports on:
Locomotive and Car Lighting.
Electric Rolling Stock.
Individual Paper, "Development of the Electric Locomotive," by F. H. Shepard, director of heavy traction, The Westinghouse Electric & Manufacturing Company.

ENTERTAINMENT

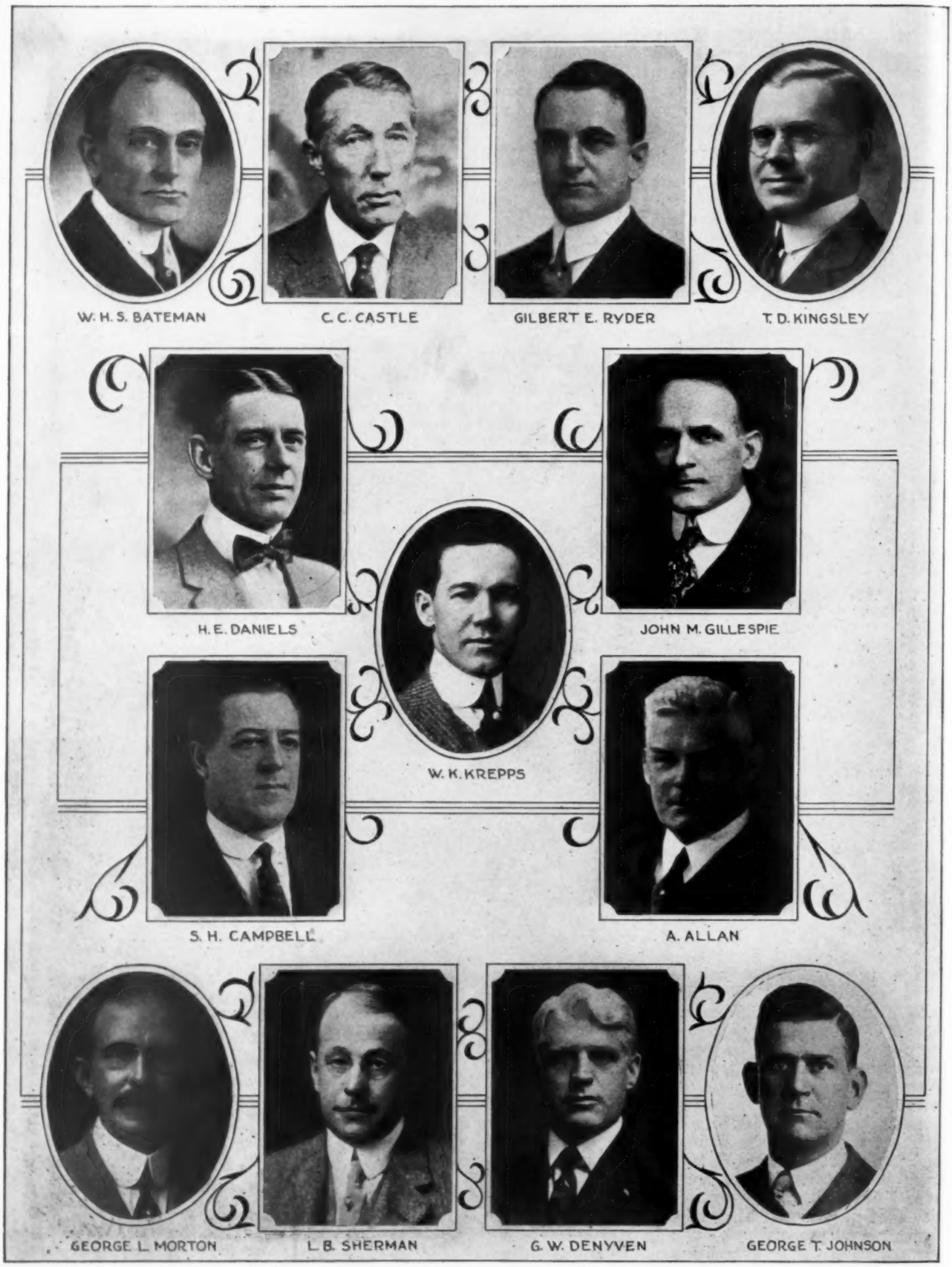
10:30 a.m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.
3:30 p.m.—Orchestral Concert and Impromptu Dancing, Entrance Hall, Million Dollar Pier.
4:30 p.m.—Tea will be served in Entrance Hall.
9:00 p.m.—Informal Dance, Canadian Night, with Special Features, Ball Room, Million Dollar Pier.

Saturday, June 14, 1924

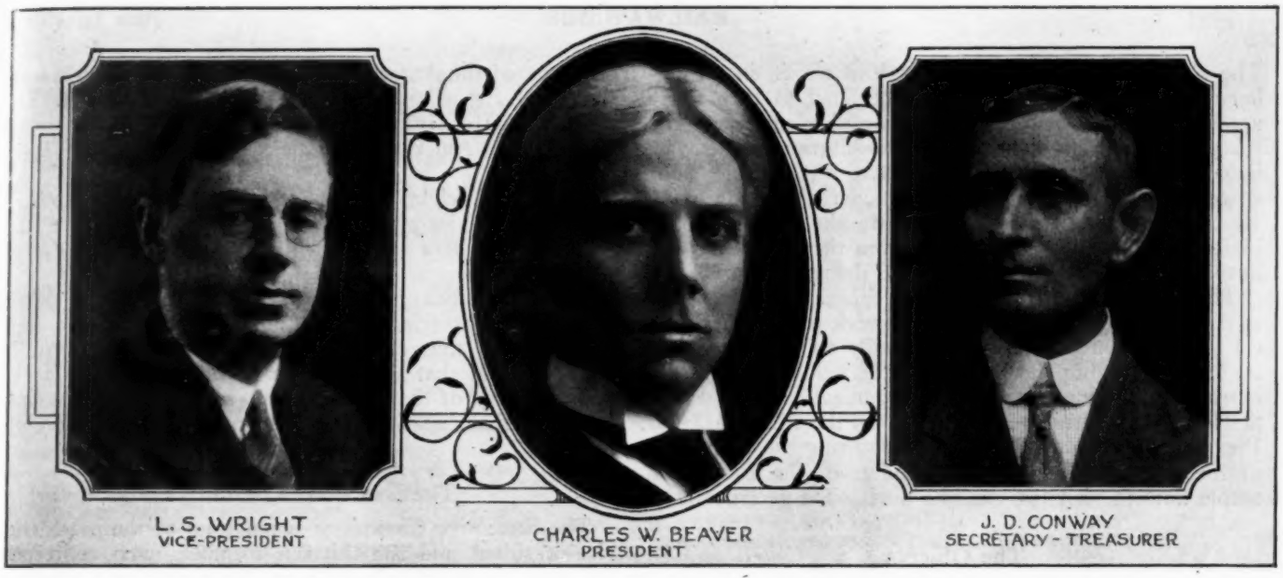
The entire day set aside by Division V to view the exhibits.

ENTERTAINMENT

10:30 a.m.—Orchestral Concert, Entrance Hall, Million Dollar Pier.
3:30 p.m.—Orchestral Concert with Impromptu Dancing, Entrance Hall, Million Dollar Pier.
9:00 p.m.—Informal Dance. Special Musical Revue arranged by Tulsa Lee, New York. Ball Room, Million Dollar Pier.



Members of the Executive Committee, Railway Supply Manufacturers Association



Officers of the Railway Supply Manufacturers Association.

R. S. M. A. Renders a Splendid Account of Itself

The Exposition of Railway Devices and Equipment Far Surpasses Previous Exhibits

FEW ORGANIZATIONS which meet only once a year can boast of the strength and virility which is characteristic of the Railway Supply Manufacturers' Association. It is, of course, true that it has developed steadily over a long period of years in conjunction with the growth of the railway mechanical department associations. Few associations, however, were so hard hit during the war and the post-war period.

This organization has as one of its tasks the responsibility of providing an exhibit during the meetings of the mechanical associations, which approximates a great exposition. This has always been a difficult task, and it was complicated enough when the meetings were held regularly each year. Since 1916, however, the meetings of the Mechanical Division have been irregular, and four times in the past eight years the exhibits have been canceled; once, in 1917, on very short notice. In some of the other years the question was not decided until within six or seven months of the scheduled time of the meeting. Many associations would have been seriously disorganized by such handicaps, but the R. S. M. A. is so well organized and officered, that every time it did have the opportunity of functioning it has made good in a decided fashion. It is doubtless true, also, that it never would have been able to carry on as it did, had there not been such a great practical educational value and return from the exhibit.

An unusual problem was presented to the association this year. Long before the time for allotting exhibit space, the demands had exceeded the space available.

The Exhibit Committee was therefore placed in an embarrassing position, because it either had to turn away applicants at the very beginning, or else cut down the space allotments to some of the exhibitors. There was, indeed, another alternative, and that was to add floor space. The latter alternative was taken advantage of so far as practicable, as is indicated in the article on exhibits, elsewhere in this number; even then, however, the available space fell far short of the demands.

The fact that the Purchases and Stores Division meets at Atlantic City during the second week of the Mechanical Division convention is undoubtedly an important factor in encouraging the growth of the exhibits. While it is true that the meetings of that organization will be held at Haddon Hall this year, and not on the Million Dollar Pier, yet sessions will be held only during the early part of the day, thus leaving the members of the association ample time to visit the exhibits during the afternoons.

The Officers

Charles W. Beaver was elected president of the association at the 1922 meeting and has had the difficult task of steering it through the two years which have since elapsed, no exhibit having been held last year. As president of the Railway Supply Manufacturers' Association during the latter part of 1922, Mr. Beaver made a conspicuous success in the performance of all the duties that were naturally a function of his office, as well as of many things that it seemed desirable in the interests of the association to do, and which duties he assigned to himself on the theory that that is a good way to get things done right.

Mr. Beaver is not old enough to make it plausible to suggest that he is responsible for the expression, "He worked like (a) Beaver," but his associates on the committee are of the opinion that it is entirely applicable and that he served as an inspiration for them to do likewise. This difficult task of inspiring a bunch of otherwise busily-occupied men came comparatively easy to Mr. Beaver through the influence of an unusual personality, a dignified atttiude toward matters, which in view of the importance of R. S. M. A. work were for the time being of serious significance, and all the other qualifications of a good executive which, so far as the work demanded, were temporarily transferred from his permanent business to this sporadic avocation.

It was in 1923, however, that the trying uncertainties of the situation called for a high degree of diplomacy. Arranging for a convention at Atlantic City with its multiplicity of details that must be cared for a long time in advance, and then effecting the cancellation of those arrangements with a minimum financial loss to the association and with good feeling all around, was a task worthy of the higher stage of leadership to which his associates had promptly promoted him. There is no hesitation in predicting that the arrangements for this year, so far as they have been in the hands of the president of the association, will be a source of satisfaction to all concerned.

Mr. Beaver is general sales manager of the Yale & Towne Manufacturing Company and vice-president of the Yale & Towne Company. He was born in Cuba, Ill., October 9, 1875. He attended Wesleyan University until 1898, leaving at that time to enter the service in the Spanish-American war, serving as Lieutenant, United States Engineers. He entered the employ of the Yale & Towne Manufacturing Company in 1900. In 1911 he was sent to Europe to reorganize the subsidiary companies and was appointed directing manager of headquarters in London. Mr. Beaver is a member and past president of the American Supply and Machinery Manufacturers' Association, a member of the American Society of Mechanical Engineers, the Pan-American Society, the American Asiatic Society and the Japan Society.

Leroy S. Wright, of the National Malleable Castings Company, is vice-president of the association. He has been a most active worker in the organization for several years.

John D. Conway, on whom a great part of the detail work of the association falls, is secretary-treasurer, and has acted in that capacity for many years; indeed, it might be said that this vocation is his specialty. He is also secretary of the Railway Club of Pittsburgh, having served in that capacity from the organization of the club in 1901.

The Executive Committee

The Executive Committee is made up of the president, vice-president and the thirteen members who represent the eight geographical districts, the eighth or Canadian district being added at the last meeting. The members of the Executive Committee and the districts they represent are as follows:

First district (New England states) one member: George W. Denyven, George W. Denyven & Co., Boston, Mass.

Second district (New York and New Jersey) three members: Charles C. Castle, National Railway Appliance Company, New York; W. K. Krepps, Crucible Steel Company of America, New York; Gilbert E. Ryder, The Superheater Company, New York.

The third district (Pennsylvania) two members: W. H. S. Bateman, The Parkesburg Iron Company, and The Champion Rivet Company, Philadelphia, Pa., and John M. Gillespie, Lockhart Iron & Steel Company, Pittsburgh, Pa.

Fourth district (Ohio, Indiana and Michigan) two members: George T. Johnson, The Buckeye Steel Castings Company, Columbus, Ohio, and Thomas D. Kingsley, S. F. Bowser & Co., Inc., Fort Wayne, Ind.

Fifth district (Illinois) two members: H. E. Daniels, West Disinfecting Company, Railroad Department, Chicago, and L. B. Sherman, Railway Age, Chicago.

Sixth district (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee) one member: George L. Morton, Galena-Signal Oil Company, Atlanta, Ga.

Seventh district (states west of the Mississippi River, including Louisiana, Minnesota and Wisconsin) one member: S. H. Campbell, Western Railway Equipment Company, St. Louis, Mo.

Eighth district (Canada) one member: Arthur Allan, The Holden Company, Ltd., Montreal, Quebec.

Exhibit Committee

The Exhibit Committee can well afford to be proud of the record that has been made under its direction this year, as is more clearly explained in the article on the exhibits. All records have been broken both as to the amount of space used and the number of firms exhibiting. The great demand for space introduced a number of complications, but these seem to have been overcome with unusual success. The members of the Exhibit Committee are all selected from the members of the Executive Committee. W. H. S. Bateman is chairman and the other members are George W. Denyven, S. H. Campbell, George T. Johnson and Gilbert E. Ryder.

Entertainment Committee

The Entertainment Committee is faced with the problem of developing a program which will be comparatively simple and inexpensive and yet will allow the convention attendants a reasonable amount of recreation and relaxation from the strenuous duties of attending the convention sessions and taking full advantage of the extensive and really remarkable exhibit. A study of the entertainment features will indicate that the committee has been eminently successful in meeting all of the requirements in a most creditable fashion. The members of the committee are:

C. W. Floyd Coffin, Chairman, Franklin Railway Supply Company, Inc., New York.
Arthur N. Dugan, Vice-Chairman, Bronze Metal Company, New York.
Stanley L. Bateman, The Parkesburg Iron Company, Philadelphia, Pa.
Charles L. Brown, Manning, Maxwell & Moore, Inc., Chicago.
J. A. Cameron, Moore, Cameron & Hill, Ltd., Montreal, Que.
J. Cizek, The Leslie Company, Lyndhurst, N. J.
J. W. Coleman, Consolidated Equipment Company, Ltd., Montreal, Que.
George T. Cooke, Union Metal Products Company, New York.
D. L. Eubank, Galena Signal Oil Company, Atlanta, Ga.
J. W. Fogg, Boss Nut Company, Chicago.
Oscar C. Hayward, Williams-Hayward Company, Chicago.
W. A. Hicks, Pennsylvania Iron and Steel Company, Creighton, Pa.
R. J. Himmelright, American Arch Company, New York.
Langley Ingraham, The Lowe Brothers Company, Dayton, Ohio.
Arthur G. Johnson, Armspear Manufacturing Company, New York.
Webb G. Krauser, Union Draft Gear Company, Montreal, Que.
H. A. Matthews, U. S. Light and Heat Corporation, Niagara Falls.
Philip L. Maury, Detroit Graphite Company, Detroit, Mich.
Floyd K. Mays, Bradford Draft Gear Corporation, New York.
L. J. McCombs, The Patterson-Sargent Company, Boston, Mass.
C. R. Naylor, T. H. Symington Company, Chicago.
N. C. Naylor, Railway Steel Spring Company, Chicago.
H. A. Pastre, Elliott Company, Pittsburgh, Pa.
Leslie R. Pyle, Locomotive Firebox Company, Chicago.
Joseph A. Renton, The Kerite Insulated Wire & Cable Company, Inc., New York.
Lewis B. Rhodes, Vapor Car Heating Company, Washington, D. C.
S. Worcester Sargent, American Steel Foundries, Philadelphia, Pa.
F. E. Symons, Ralston Steel Car Company, Columbus, Ohio.
J. H. Van Moss, Pennsylvania Car Company, New York.
H. A. Varney, Sunbeam Electric Manufacturing Company, Chicago.
Fred W. Venton, Crane Company, Chicago.
A. Fenton Walker, Canadian Railway and Marine World, Toronto, Canada.
George E. Watts, The Duff Manufacturing Company, Atlanta, Ga.
Joseph R. Wetherald, The Champion Rivet Company, Philadelphia, Pa.
Carter P. Whitcomb, Griffin Wheel Company, Boston, Mass.
S. B. Wight, Jr., Standard Steel Car Company, New York.
W. M. Wilson, Flannery Bolt Company, Pittsburgh, Pa.

Transportation Committee

The Transportation Committee has an unusually difficult task. It must look after the operation and assignment of the rolling chairs and other local transportation matters. This is no easy assignment when one stops to consider the size of the convention group and the courtesies which are extended in the way of the free use of rolling chairs to those who wear official badges. Naturally misunderstandings and difficulties arise, but the convention attendants may feel sure that these will receive courteous consideration when brought to the attention of any of the members of the Transportation Committee. Its members are:

A. L. McNeill, Chairman, Central Electric Company, Chicago.
George C. Hannaway, Vice-Chairman, The National Refining Company, Chicago.
W. F. Bauer, Edison Storage Battery Company, Chicago.
Clif Beaumont, Boss Nut Company, Baltimore, Md.
George C. Berger, Gould Storage Battery Company, Chicago.
Ralph Brown, The Curtain Supply Company, Chicago.
C. E. Boyce, A. M. Castle & Company, Chicago.
C. L. Butler, Detroit Lubricator Company, Chicago.
H. A. Clark, Garlock Packing Company, Montreal, Canada.
T. E. Clifford, Globe Steel Tubes Company, Chicago.
Howard P. Cook, Columbia Nut & Bolt Company, Bridgeport, Conn.
F. J. Coolidge, The Buckeye Steel Castings Company, Chicago.
F. M. Condit, Fairbanks Morse Company, Chicago.
James L. Crowley, Templeton Kenly Company, Ltd., Chicago.
J. W. Crowley, Chicago Pneumatic Tool Company, Chicago.
A. W. Clokey, American Arch Company, Chicago.
H. E. Daniels, West Disinfecting Company, Chicago.
L. R. Dewey, American Brake Shoe & Foundry Company, Chicago.
L. F. Flanagan, Detroit Graphite Company, Chicago.
Frank B. Flinn, Griffin Wheel Company, Chicago.
E. C. Folsom, Railway Materials Company, Chicago.
C. H. Friday, Illinois Steel Company, Chicago.
J. N. Gallagher, O'Malley-Beare Valve Company, Chicago.
C. H. Gaskill, Baldwin Locomotive Works, Philadelphia.
E. L. Georger, Pratt & Lambert Company, Chicago.
E. F. Gladwell, Buffalo Break Beam Company, Lackawanna, N. Y.
K. M. Hamilton, Bettendorf Company, Chicago.
William Hickey, Magnus Metal Company, Chicago.
Cyrus J. Holland, The Wine Railway Appliance Company, Chicago.
W. A. Houston, Joseph Dixon Crucible Company, Baltimore, Md.
Henry S. LaBarge, H. Channon Company, Chicago.
R. R. Lally, Globe Steel Tubes Company, New York.
George J. Lawrence, J. B. Ford Company, Wyandotte, Mich.
Charles McCormick, Ruberoid Company, Chicago.
George Murphy, Mangus Metal Company, Chicago.
R. R. Porterfield, The Superheater Company, Chicago.
H. T. Rieck, Illinois Malleable Castings Company, Chicago.
H. D. Richardson, American Steel Foundries, New York.
John Roberts, General Electric Company, Schenectady, N. Y.
W. J. Roehl, St. Louis, Mo.
W. B. Ross, Edwin S. Woods Company, Chicago.
E. N. Thulen, Duff Jack Manufacturing Company, Chicago.
J. P. Tarpey, Pittsburgh Spring & Steel Company, Chicago.
W. Thulen, Chicago Pneumatic Tool Company, Chicago.
L. F. Theurer, Pittsburgh Plate Glass Company, Chicago.
J. H. Trent, Johns-Manville, Inc., St. Louis, Mo.
J. D. Underhill, The Okonite Company, Passaic, N. J.
R. R. Wells, Hunt Spiller Manufacturing Corporation, Boston, Mass.
T. F. Williams, Chicago Cleveland Car Roofing Company, Chicago.
A. R. Wilson, Hutchins Car Roofing Company, Detroit, Mich.

Enrollment Committee

This committee, like the Transportation Committee, must work intensively during the convention. The problem has been studied critically over a long period of years, however, and the operations under the direction of the committee function smoothly and with a minimum loss of time on the part of those who register. The individual members of the committee gain some relief by a carefully developed scheme of working by shifts. The responsibility for the publication of the enrollment lists is charged to this committee. Few people who use these lists, and they are invaluable, realize the amount of detail work that is necessary in their preparation and publication. The members of the Enrollment Committee are:

Franklin H. Smith, Chairman, Gold Car Heating & Lighting Company, Brooklyn, N. Y.
S. Inglis Leslie, Vice-Chairman, The Leslie Company, Lyndhurst, N. J.
G. A. Barden, King Pneumatic Tool Company, Philadelphia, Pa.
C. L. Bates, Railway Review, New York.
E. A. Bedell, The B. F. Goodrich Company, Chicago.
J. E. Brown, O'Malley-Beare Valve Company, New York.
H. L. Burrhus, Hennessy Lubricator Company, New York.
J. E. Dodson, United States Rubber Company, Baltimore, Md.
A. B. Edge, Detroit Graphite Company, Atlanta, Ga.
C. H. Gertner, Railway Review, Chicago.
Arthur Haller, American Locomotive Company, Chicago.
R. A. Holme, MacRae's Blue Book, New York.
F. L. Johnson, Pressed Steel Car Company, Chicago.
F. C. Koch, Railway Age, New York.
H. V. McKedy, Patterson-Sargent Company, New York.
P. B. Miller, Walworth Manufacturing Company, Boston, Mass.
J. M. Rutherford, Railway Age, Chicago.
W. R. Van Steenburgh, The Okonite Company, New York.
H. K. Williams, Safety Car Heating & Lighting Company, New York.
Edward Wray, Railway Purchases & Stores, Chicago.

Other Committees

There are several other important standing committees, all of which are made up entirely from the membership of the Executive Committee, as follows:

Badge Committee—L. B. Sherman, chairman; T. D. Kingsley and A. Allan.

By-Laws Committee—George L. Morton, chairman; Charles C. Castle and L. B. Sherman.

Finance Committee—John M. Gillespie, chairman.

Hotel Committee—W. K. Krepps, chairman; Charles C. Castle and H. E. Daniels.

Post Office and Mail

United States mail addressed in the care of the Office of the Secretary of the Railway Supply Manufacturers' Association, Million Dollar Pier, Atlantic City, N. J., will be taken care of and distributed to exhibitors' booths. Members are requested not to send general circular matter for distribution to other exhibitors, as this is a violation of the association rules.

Rolling Chairs

Rolling chairs will be provided for the members and guests who wear official badges, from the stations and between the hours indicated in the following table.

	a.m.	p.m.
The Pier	9.00 to	6.30
Marlborough-Blenheim	9.00 to	6.00
Traymore	9.00 to	6.00
Chalfonte Hotel	9.00 to	6.00
Chelsea Hotel	9.00 to	6.00
Alamac Hotel	9.00 to	6.00
St. Charles Hotel	9.00 to	6.00
The Breakers	9.00 to	6.00
Ambassador Hotel	9.00 to	6.00
	p.m.	p.m.
To all entertainments on Pier	8.30 to	10.00

The convention chairs will not be allowed to wait more than 15 minutes. Unoccupied chairs assigned to the convention may be stopped at any point on the Boardwalk, except between the Marlborough-Blenheim and the Pier, and may be used in either direction.

Railway Club Secretaries Meet Tomorrow

The Society of Railway Club Secretaries will hold its usual meeting beginning at 10 a. m., Thursday, June 12, at the Marlborough-Blenheim hotel.

The business session may be extended to Friday if necessary. The first session will be followed by a round table luncheon at the same place immediately after the adjournment of the Mechanical Division meeting about 1 p. m.

This social feature of the society's meeting was established several years ago. It provides for the interchange of helpful suggestions and experiences and the development of good fellowship between the representatives of the different clubs. Participation is limited to members and invited guests who always include the club presidents or the next highest ranking executive of the clubs who may attend the A. R. A. meetings.

Electrical Engineers Meet on Thursday

The Association of Railway Electrical Engineers will hold its semi-annual convention at the Hotel Dennis, on Thursday, June 12. The meeting will open promptly at 9:30 a.m., daylight saving time. The convention is of particular interest because of the unusual number of reports to be presented on important problems. The significance of the work being done by the Association is shown by the list of committees, which is as follows: Committee on Safe Installation and Maintenance of Electrical, Equipment, Sponsor Committee on Insulated Wire and Cables, Committee on Economics of Electrical Appliances, Committee on Power Plants, Committee on Starters and Controllers, Committee on Illumination, Committee on Electric Storekeeping, Committee on Electric Locomotive, Committee on Radio as Applied to Moving Trains, Committee on Train Lighting Equipment and Practice, Committee on Self-Propelled Cars, Committee on Electric Welding, Committee on Automatic Train Control, Committee on Trucks and Tractors.

Long Distance Telephone Service

A switchboard with necessary operators will be established on the Pier in connection with several long distance booths, conveniently located in different sections of the Pier.

Enrollment Regulations

The membership in Division V and Division VI is held by railroads and not by individuals. Mechanical department officers above the rank of foreman, and purchases and stores officers having the title of assistant stores keeper or higher rank, are entitled to membership badges. Representatives of these two departments below these ranks will be furnished with guest badges.

The badge numbers assigned to the various classifications are as follows:

Members, Division V	1-1465
Members, Division VI	1500-2016
Guests	10000-11199
Railroad ladies	3200-4499
Supply men	5200-7999
Supply ladies	8200-8999

Badges will be delivered direct to those entitled to them, and cannot be secured through a third party. Badges must not be loaned. The enrollment booth will be open during the convention at the following hours:

		Morning	Afternoon	Evening
Wednesday,	June 11	9 to 1	2 to 6	7 to 8
Thursday,	June 12	9 to 1	2 to 6	7 to 8
Friday,	June 13	9 to 1	2 to 6	7 to 9
Saturday,	June 14	9 to 12	2 to 5	7 to 9
Sunday,	June 15	10 to 12	2 to 4	7 to 9
Monday,	June 16	9 to 1	2 to 6	8 to 9
Tuesday,	June 17	9 to 12	2 to 6	
Wednesday,	June 18	9 to 11		

Chicago Special

The first section of the convention special on the Pennsylvania left Chicago on schedule time, 1.10 P. M., Monday, and arrived at Atlantic City yesterday at 12.30 P. M.; it arrived as the second section on account of a slight delay in Ohio due to one of Mr. Ford's justly famous cars. The second section left Chicago at 1.15 P. M., arriving at Atlantic City at 12.20 P. M., ahead of the first section. The first section carried 181 passengers for the Atlantic City convention and the second section brought 170 railway and railway supply people. This total 351 passengers exceeds the previous record of conventionites carried by the Pennsylvania special train to Atlantic City (in 1922) by 64.

The equipment of the two sections was much the same, 13 cars each, consisting of club cars, standard Pullmans, two diners and observation cars.

Registration, American Railway Association

Division V—Mechanical

Alquist, P., M. C. B., P. M., Ambassador.
Anderson, J. A., Shop Supt., C. M. & St. P., Ambassador.
Anderson, R. W., S. M. P., C. M. & St. P., Traymore.
Barnes, C. S., Shop Acct., C. & I. M., Lexington.
Battley, E. R., S. M. P., C. N. R., Chalfonte.
Becker, E., M. M., G. B. & W., Strand.
Bell, J. S., Bothwell.
Bentley, H. T., G. S. M. P., C. & N. W., Marlborough.
Bilty, C. H., M. E., C. M. & St. P., Ambassador.
Blackburn, H. E., Apprentice Inst., Erie, Seaside.
Blunt, J. G., Mech. Eng., A. L. Co., Traymore.
Bond, C. R., Buyer, Swift & Co., Ritz-Carlton.
Cratzen, C. A., Pass. Rep., Penna.
Curry, E. B., Welding Supt., C. M. & St. P., Brighton.
Curry, H. M., N. P., New Brighton.
Daly, M. A., Gen. Frt. Supt., N. P., Shelburne.
Davis, W. P., M. M., N. Y. C., Haddon Hall.
DeSalis, J. H., M. M., N. Y. C., Pennhurst.
Deverell, A. C., Marlborough.
Endsley, L. E., Chalfonte.
Ernest, L., G. M. M., M. St. P. & S. S. M., Traymore.
Fetner, W. H., Ch. Mech. Officer, M. P., Brighton.
Fetters, A. H., M. M., U. P., Ambassador.
Fletcher, L. E., Supt. Shops, A. T. & S. F., New England.
Giles, C. F., Supt. Mach, L. & N., Marlborough.
Goodwin, G. S., Mech. Eng., C. R. I. & P., Chalfonte.
Grimm, E. L., Asst. to G. M. S., N. P., Ambassador.
Hall, F. D., E. E., B. & M., Ambassador.
Harrison, W. R., M. M. A. T. & S. F., Dennis.
Haskell, B., Haddon Hall.
Hass, G. F., S. M. P., Wabash, Traymore.
Isaminger, F. E., Supt. Car Equip., Roxana Petroleum Corp., Strand.
Jackson, O. S., S. M. P. & M., U. P., Traymore.
Johnson, B. P., G. M. M., N. P., Haddon Hall.
Johnson, H. W., S. M. P., M. & St. L., Ritz-Carlton.
Kinney, M. A., S. M. P., H. V., Traymore.
Kirby, T. M., Mech. Asst. to G. S. M. P., C. M. & St. P., Strand.
Kleine, R. L., Asst. Ch. M. P., Penna., Dennis.
Lamberg, G., Shop Supt., C. M. & St. P., Ambassador.
Lewis, B. N., Mech. Supt., M. St. P. & S. S. M., Strand.
Lundberg, C. H., Supt. C. S., A. T. & S. F., Dennis.
McCormick, George, Gen. Supt M. P., So. Pac., Marlborough.
McCuaig, S. M. P., C. N. R., Ambassador
McGoff, J. H., Mech. Supt., A. T. & S. F., Knickerbocker.
McLaughlin, J. R., Draftsman, Penna., Pennhurst.
Montagnet, J. M., Acct., Public Belt of N. O., Ambassador.
Montgomery, Hugh, S. M. P., Rutland, Dennis.
Moore, B. R., S. M. P., D. & I. R., Traymore.
Moore, G. W., Asst. S. M. P., St. L.-S. F., Chalfonte.
Nowell, H. T., Mech. Supt., C. Vt. Haddon Hall.
Parks, G. E., M. E., M. C., Brighton.
Parsons, C. F., G. M. M., N. Y. C., Chalfonte.
Parsons, J. G., Supt. Shops, N. Y. C., Chalfonte.
Peck, C. B., Mech. Dept. Editor, Railway Age, Dennis.
Roberts, John, S. M. P. Shops, C. N. R., Shelburne.
Robinson, Lee, Shop Eng., I. C., Ambassador.
Rusch, Frank, S. M. P., C. M. & St. P., Strand.
Schlafge, William, Traymore.
Schroyer, C. A., Rtd. Supt. C. D., C. & N. W., Haddon Hall.
Seddon, C. W., S. M. P., D. M. & N., Traymore.
Seidel, G. W., S. M. P., C. & A., Traymore.
Shaffer, C. A., Gen. Supr. S. M. & T., I. C., Ambassador.
Sweeney, A. P., Asst. Secy., A. R. A., Marlborough.
Symons, W. E., Cons. Eng., L. E. F. & C., Strand.
Tatum, J. J., Supt. C. D., B. & O., Marlborough.
Thorsen, O. J., M. M., E. & L. S., Haddon Hall.
Tollerton, W. J., S. M. P., C. R. I. & P., Marlborough.
Townsend, J. J., M. M., C. & I. M., Lexington.
Turney, John, M. M., C. M. & St. P., Ambassador.
Withrow, P. C., M. E., D. & R. G. W., Traymore.
Worman, H. L., S. M. P., St. L. & S. F., Dennis.
Wright, J. A., M. M., C. M. & St. P., Strand.
Wright, R. V., Managing Editor, Railway Age, Dennis.
Wymer, C. J., Supt. C. D., C. & E. I., Traymore.
Yates, L. L., Gen. Supt. C. D., Pac. Fruit Ex., Ambassador.

Special Guests

Bond, R. J., Div. Eng., Penna.
Brady, F. W., I. C. S., Strand.
Browne, T. C., Schedule Eng., Erie, Seaside.
Detwiler, H. L., Fed. Insp. Loco., Commercial.
Fuller, C. E., U. P., Blenheim.
Hammond, C. H., Gen. Frt. & Pass. Agt., P. S. & N.
Harding, J. W., I. C. S., Strand.
Harris, J. H., Eng. M. of W., Penna.
Harrison, W. L., Dennis.
Harrold, J. W., Cl., Penna.
Haverstick, P. W., Spvr. Tk., Penna.
Herbert, T. C., Div. Supt., Penna.
Kuhlke, O. H., Fredonia.
Marshall, C. L., C. & N. W., Marlborough.
Nash, H. T., Chalfonte.
Noxon, F. W., States Villa.
Phelps, J. R., Apprentice Inst., A. T. & S. F., Ritz-Carlton.
Rowley, C. B., Shelburne.
Siebert, F. T., Commercial.
Swartz, P. A., Dennis.
Tatum, C. R., B. & O., Marlborough.
Wells, F. L., Ex. Pres., L. & T., Marlborough.
Whaley, T. H., Boiler Insp., Penna.
Willse, H., Cl., A. R. A., Runnymede.
Wilson, G. F., Ret. S. M. P., R. I., Sterling.
Wood, W. B., Gen. Supt., Penna.
Ziesel, G. L., Frt. Agt., Penna.

Conventionalities

Notwithstanding the unusually cold season, it is said that Jersey mosquitoes have been made to furnish a passable alibi for unsatisfactory scores at the golf links.

President Charles W. Beaver, of the Railway Supply Manufacturers' Association, was treated to a litt!e surprise last evening. He had entertained at the Shelburne grill the members of the Executive Committee of the R. S. M. A. At the conclusion of the happy affair, W. H. S. Bateman, in behalf of the committee, presented Mr. Beaver with a complete full dress set of diamond-studded platinum buttons and studs.

The unfortunate results of keeping one's nose too close to the grindstone, even at Atlantic City, are suggested by the inmates of the aquarium at the south end of the ballroom on the pier. It will be noticed that many of the occupants of the tanks, apparently impatient of or inquisitive regarding their transparent environment, have developed a well-defined callous at the end of what must pass in piscatory verbe brakes for a nose.

So far as records show, H. M. Perry, representing Edwin S. Woods & Co, Chicago, holds the honors for attendance at the greatest number of conventions. He says now he doesn't remember when he began to attend; but several years ago (in 1908), when the "Old Timers' Register" was opened, he confessed to 41. His record this year is one of attendance at 54 conventions. It would have been his 57th had not the annual meetings been ommitted during three years. He held himself in readiness to attend each year when they were called off.

J. M. Davis, president of Manning, Maxwell & Moore, Inc., is accompanied to the convention this year by Mrs. Davis and their daughters, Mildred and Bernice. Mr. Davis has now been in the railway supply business four years, after having spent thirty years in the railway service, during which time he rose from the ranks to vice-president in charge of operation of the Baltimore & Ohio. Being such a youngster as he still is, it is hardly necessary to say that he got his first railway job at the age when nowadays most boys are expected to be in high school.

Jenkins Bros. have just celebrated the sixtieth anniversary of the Jenkins valve by calling in their salesmen from all over the world—from England, Cuba, Mexico, the Hawaiian Islands, Canada—84 men, including the salesmen in the United States, and holding a grand powwow. The party was taken to Bridgeport for inspection of the big valve manufactory and its recent million-dollar addition just completed; then to New York, where a banquet was held at the Biltmore. The affair was in charge of C. B. Yardley, who represents the corporation at Atlantic City, and his fellow workers showed their appreciation of his successful efforts to entertain them by presenting him a handsome Hamilton gold watch.

A stranger on the pier on Monday, unfamiliar with the activities of those who assemble here from year to year and with the superheated activity which they succeed in injecting into local talent, would be inclined to state a

week or ten days as the irreducible minimum within which the exhibits could be put into presentable shape. But it is not so. By the time these lines have been read on Wednesday morning, and unless past experience fails to be repeated, substantially everything will be in place. Except the display of the man whose exhibit, for one reason or another, fails to show up. If there should be any such, him we can sympathize with in the words of Lachlan Campbell in J. M. Barrie's "The Bonnie Brier Bush": "There wass a laddie feeshing in the burn before my house, and a very pretty laddie he wass. He had a rod and a string and he threw his line beautiful. It was a great peety he had no hook, for it iss a want, and you do not catch many feesh without a hook."

George Gibbs, of Gibbs & Hill, consulting engineers, New York, who was formerly one of the active young men of the conventions, but who in recent years has been engaged in many of the larger projects involving electric traction, was a caller at the pier on Monday evening on his way to Virginia where the activities of the Norfolk & Western and the Virginian railways in this line have been carried on under his direction. It is now nearly twenty-five years since as mechanical engineer of the Chicago, Milwaukee & St. Paul he constituted a part of the team —J. N. Barr, A. E. Manchester and John J. Hennessey, who is still with us, were others of the same team—which did great work in making the influence of the Central West felt in the national affairs of the M. C. B. and M. M. associations. But his activities have ever since been associated primarily with railways, and particularly with electrical operation of steam roads. It is perhaps a far cry from the invention of the berth light for sleeping cars, in which Mr. Gibbs early showed his electrical leanings—when electrical appliances on railways were in the infantile stage—to the development of electrical operation on the Virginian, which will make use of the greatest combination of electrical railway units ever operated. But it is in the same general line—the student of electrical science keeping ahead of his art.

This is not the place to enter deeply into the description of the work on the Virginian which marks the most recently erected milestone in railway operation by electric power. A few words will indicate its nature and magnitude. It happens that in the construction of the Virginian Railway, and though its line follows through a part of its course the course of New River, the latter is a smaller edition of the Royal Gorge on the Grand Canon of the Colorado, and in some instances grades are encountered over which the heavy coal trains of the Virginian can be economically hauled only by the employment of large combined units of power. In this service three units, similar in most respects to those of the Norfolk & Western which uses two units, will be semi-permanently connected to form one locomotive. This combination will develop a maximum tractive effort of 277,000 lb. at any speed up to 14 m. p. h. hauling 6,000 tons on the 2.11 grade from Elmore to Clark's Gap with one road locomotive and one pusher each composed of three units. The combination will handle 9,000 tons on the section of the road from Clark's Gap into Roanoke, making the run from Elmore to Roanoke, 131.6 miles, in ten hours. To haul trains of 5,500 tons from Elmore yard to Clark's Gap now requires three Mallet locomotives, and the speed is approximately seven miles per hour.

One of the old-timers who has been a regular attendant at conventions for more years than most of us can remember will be with us no more. William H. Lewis, retired superintendent of motive power, Norfolk & Western, to which road he went from the Burlington in 1897, was buried last Friday at Chicago. "Uncle Billy," as he was familiarly known to old and young alike, was born October 18, 1845, at Syracuse, N. Y. He entered railway service in 1861 as machinist apprentice on the New York Central and was consecutively, 1864 to 1865, machinist, Chicago, Burlington & Quincy; 1865 to 1869, machinist, Hannibal & St. Joseph; 1869 to 1873, locomotive engineer, same road; 1873 to 1878, general master mechanic, Northern Pacific; 1878 to 1882, division foreman, Kansas Pacific; 1882 to 1884, master mechanic, Oregon Short Line; 1884 to 1888, master mechanic, New York, Chicago & St. Louis; 1888 to July 1, 1897, master mechanic, Chicago, Burlington & Northern; July 1, 1897, to November, 1918, superintendent motive power, Norfolk & Western. On the latter date he retired from active service. He was in attendance at the convention in 1922 and his many friends had looked forward to the pleasure of greeting him this year. He will not come. The passing of Uncle Billy is a reminder that many names will be read at the opening of the present convention of those who have gone forward during the two years since the last convention. It also suggests that there are many others whose names will not be read in the same connection who also have departed—members of the second and third of the three estates that make up these conventions. Of these there are many names that will be missed when the registration lists are made up—some who, at different times, represented one or the other of the adjuncts of the principal associations. Among these one at once thinks of Waldo H. Marshall, formerly a newspaper editor, later a railway mechanical and executive officer, and more recently still, president of the American Locomotive Company. William Forsyth also had for years been a constant attendant upon, and participant in the railway conventions as a mechanical officer and latter until his retirement as one of the editors of *The Daily Railway Age*. Other names that at once come to mind because of the absence of those who bore them whom we have for many years been accustomed to see from the *alpha* of the opening day to the *omega* of the evacuation of the pier, are Dr. C. W. Gould, Gould Conpevi Co.; Francis J. Cole, American Locomotive Co.; Percy M. Elliott, Carmel Co.; Clyde M. Carr, Jos. T. Ryerson & son; Williard A. Smith, Railway Review; R. E. Adreon, American Brake Co.; R. E. Janney, and many others. Within our own family and within the last two or three years our ranks have been depleted by the loss of Frank Dinsmore, who not only knew every exhibitor but every exhibitor's representative on the pier; John Reynolds, who had known all these people since the time when the memory of man runneth not to the contrary; as well as of William Forsyth. But this is getting too near home.

The arrival of C. A. Schroyer, former superintendent car department, Chicago & North Western, and president of the Master Car Builders' Association, in 1899, reminds us of the trick he played upon the *Daily*, the year before he was elected. With full confidence in the selective wisdom of the Nominating Committee that year, the *Daily* had provided itself with an excellent photograph of Mr. Schroyer with the view to surprise its readers with its up-to-date-ness in publishing it a few hours after the election. But Mr. Schroyer appeared to receive the honor conferred upon him without the customary adornment of his upper lip. It was only by a piece of excellent work on the part of a Saratoga photographer coupled with Mr. Schroyer's never-failing good nature that enabled us to publish a most truthful likeness of the president-elect the next morning. Moreover, he liked the picture as well as we did.

New Devices Among the Exhibits

Graham-White Sand Spreader

THE WHITE AMERICAN LOCOMOTIVE SANDER COMPANY, INC., Roanoke, Va., has on exhibition the Graham-White sand spreader, details of which are shown in the drawing.

In Fig. 1, the semi-circle, *AB*, represents a horizontal

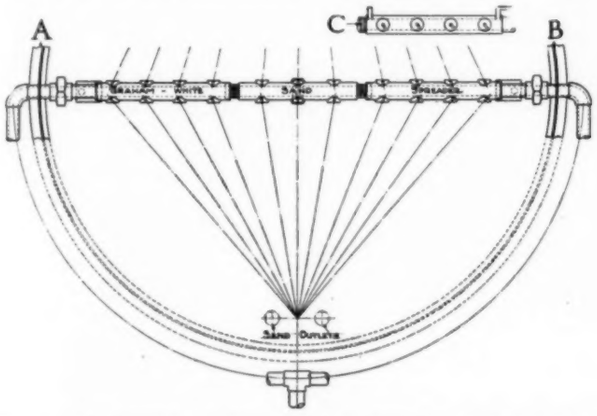


Fig. 1—Horizontal Section of Sand Box Showing the Location of the Sand Spreader

section of a locomotive sand box just above the base. The detail *C* shows a section of the spreader turned up to show the supports and nozzle openings. Fig. 2 shows the operating valve for spreader, which is placed in the cab.

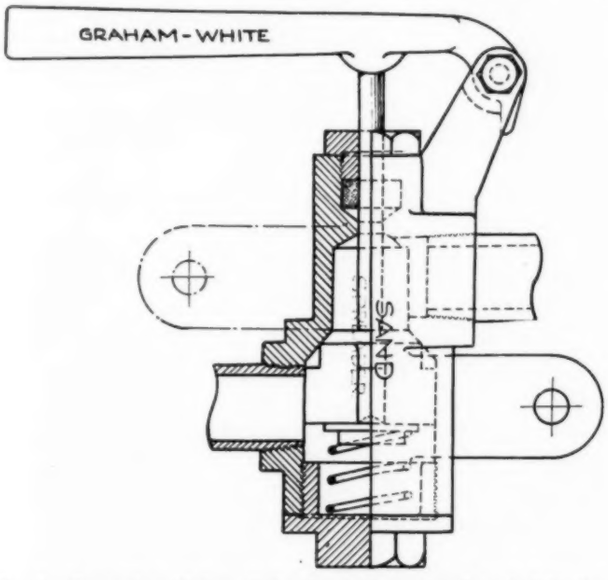


Fig. 2—Operating Valve of the Sand Spreader, Located in the Locomotive Cab

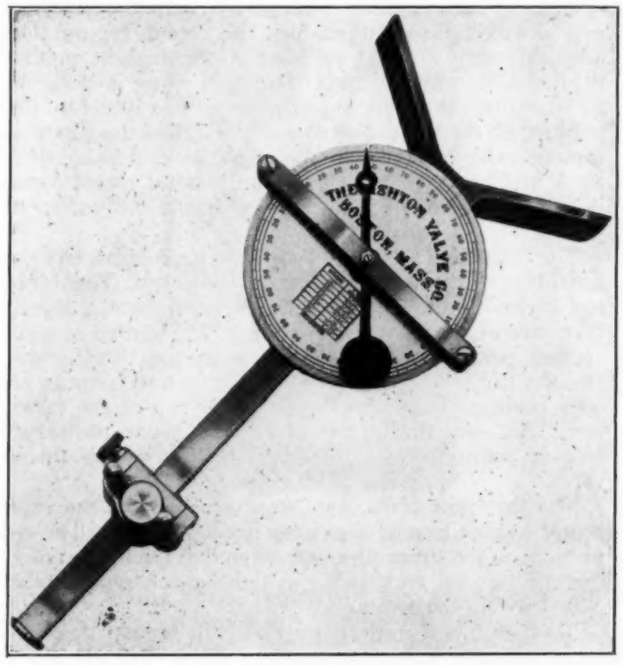
By means of this simple disk valve the engineman sends a blast of main reservoir pressure through the sand spreader, which lies on the bottom of the sand box parallel with the top line of the boiler. The air admitted to this spreader passes out into the sand through the nozzles and drives the sand from the center of the box over to the sand outlets.

This sand spreader will break up any lumps of sand that may develop in the sand box and will at the same time move over to the outlets sand that would otherwise remain piled in the center of the box. By this means all of the sand in the box is available for use without the necessity of the engineman or fireman going out on the run board to rake it over to the outlets.

It will be noted that the device is made in sections and is, therefore, adjustable for any size of sand box. The operating valve is self-closing and the air blast is, therefore, active only while the engineman is holding the valve open. Four or five seconds is usually all the time required to move the sand from the center of the box to the outlets.

Improved Quartering Gage

THE ASHTON VALVE COMPANY, Boston, is exhibiting an improved design of its locomotive driving wheel quartering gage. This device provides a rapid method of checking the setting of wheel centers on axles. The adjustable arm has been constructed with a more substantial centering guide and has been lengthened so that



Setting of Wheel Centers can be Rapidly Checked with this Gage

the capacity is sufficient for gaging driving wheels with from 18 to 32 in. stroke. The gage reading, shown in degrees on the dial by a gravity operated pointer, can be easily changed to the corresponding fractions of an inch by the use of a scale on the face of the dial.

Lubricating Cup for Air Pumps

THE LUBRICATION of the piston rods of air pumps has been the source of a serious handicap to their proper operation. The air pump lubricating stuffing-box nut and gland which is being exhibited by the Badeker Manufacturing Company, Chicago, tends to reduce this trouble.

The nut and gland are so designed that when the nut is removed the gland lifts out with it as a single unit. This feature is an advantage when it becomes necessary to repack the pump, as no special provision is necessary to remove the gland or hold it out of the way when packing and also eliminates the use of special packing tools. The stuffing box nut is less liable to become cross-threaded because the patent floating gland acts as a guide. A locking device is provided on the box nut which prevents it from working loose.

Chambers Front End Locomotive Throttle Valve

MANY MECHANICAL department officers believe that the most desirable location for the throttle valve on locomotives using superheated steam is between the superheater header and the cylinders. This type of throttle protects the superheater units from overheating by keeping them constantly filled with steam and gives better control of the locomotive by reducing the volume of steam between the throttle valve and the cylinders. It also permits the use of superheated steam in the auxiliaries and enables the steam supply to be taken through a large opening at the highest point in the dome, thus avoiding carrying over water in the steam, and insuring the maximum superheat. The Bradford Corporation, New York, has recently designed the Chambers throttle valve for application in the front end ahead of the stack and has applied this type on several recent orders. A full-size valve is being exhibited at the convention this year.

The Chambers front end throttle valve is operated by the usual type of throttle lever, located in the cab. The throttle rod is outside the boiler and has a compensating lever to take care of the expansion of the boiler, located at a convenient point about midway between the throttle valve and the cab. The front throttle rod connects to an arm on a horizontal operating shaft at the top of the throttle box. An arm of the operating shaft inside the throttle box is connected to the link which lifts the throttle valve.

The throttle box has two steam inlets from the superheater header located above the throttle valve. The connections to the steam pipes are located at the bottom of the throttle box on each side. All the steam pipes are enclosed within the front end.

To design a throttle valve that will remain tight with high pressure superheated steam is a difficult matter. Castings exposed to high temperatures warp and these strains in the throttle box and valve are likely to cause leaks. This special design of throttle valve takes care of these distortions so that no difficulty is experienced in keeping the valve tight, owing to the fact that it has a single seated valve and a separate ring seat. The ring seat has a flat ground joint on the throttle box and a taper joint on which the throttle valve seats. The ring seat is of a comparatively light section and when the full steam pressure is acting on the main valve, the force is sufficient to make the ring seat conform to any slight irregularities in either the throttle box or the valve itself.

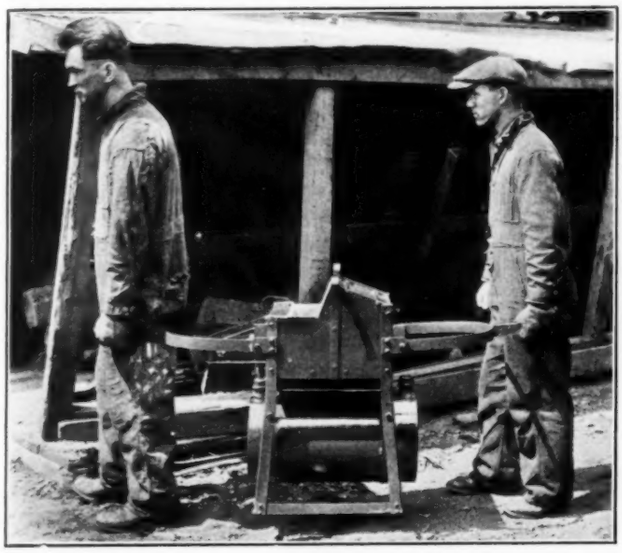
The balancing of this throttle valve is accomplished by the same method that is used in the Chambers saturated steam throttle valve. Beneath the main valve there is a balancing piston of the same diameter as the valve. This piston is a tight fit in the balancing chamber and when the valve is closed the pressure under the piston is the same as the pressure in the front steam pipe. The valve is opened by first lifting the small pilot valve at the center of the main valve. This permits steam to flow through the center of the main valve and enter the chamber under the balancing piston. When the pressure under the balancing piston has equalized with the boiler pressure, the valve is perfectly balanced, so that the steam pressure has no effect upon it and it can easily be moved to any desired position.

A Balanced Throttle Valve Which Is Supplied With Steam Direct from the Superheater Header

The graduated opening of the steam passage, obtained with the Chambers throttle valve, is especially advantageous when superheated steam is used. The first opening of the throttle is through the pilot valve, as already mentioned. This permits a slight amount of steam to flow through the relief opening in the balance piston, but this is negligible. The first opening of the valve allows steam to pass through the small clearance between the curtain wall of the main valve and the ring seat. Raising the valve a slight distance further, opens a series of 24 1-4-in. holes around the main valve. After these holes pass the top edge of the ring seat, steam is gradually permitted to enter the passages between the rings on the main valve and the ring seat until the valve is fully opened, in which position the area through the valve is equal to the full cross-sectional area of the steam passages.

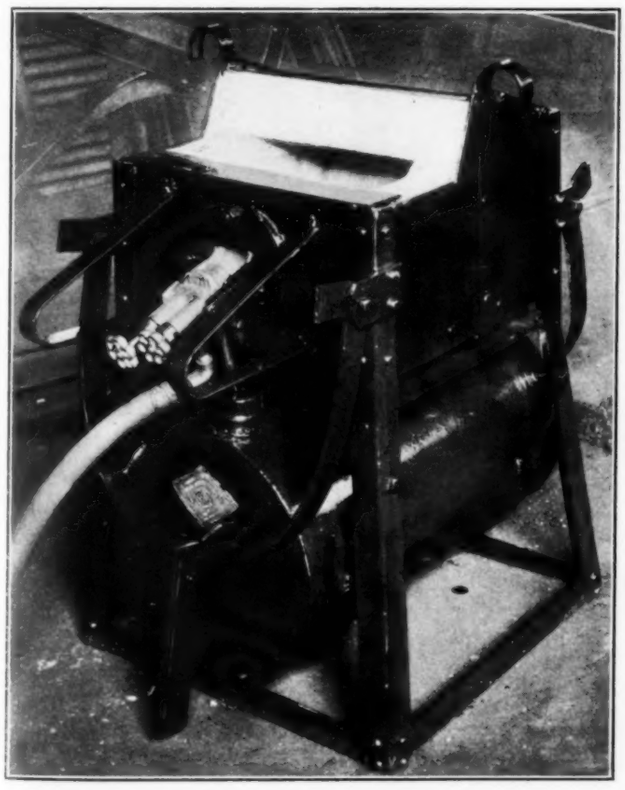
Portable Rivet Heating Forge

A RIVET HEATING forge manufactured by the Mead-Morrison Manufacturing Company, East Boston, is being exhibited by E. Emery, Pittsburgh. The designer of this forge developed some interesting features,



The Mead-Morrison Rivet Forge Can Be Readily Carried

the oil tank operates under atmospheric pressure, the consumption of air is economical, and the forge is easily portable.



Heating Forge with Oil Tank Under Atmospheric Pressure

The oil is drawn up from the tank through the burner by compressed air. Both the flow of the oil and the air are regulated by needle valves. The construction of the furnace portion of the forge is such that the flame impinges on the bottom of the arch tile, and the gases go down the back onto the work, which is located on the bottom of the furnace. The waste gases then come up over the front face of the tile. Owing to the path of waste gas travel the forge does not require an air curtain to protect the operator from the heat. This tends to reduce the air consumption.

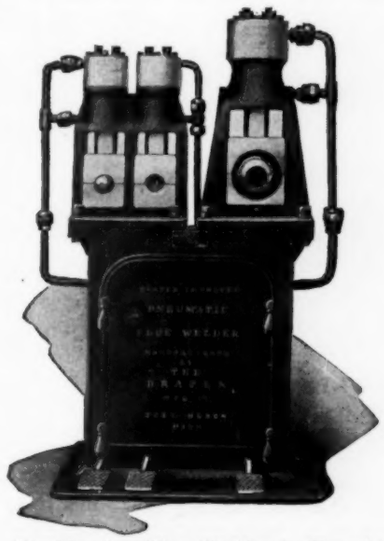
The construction of the burner reduces the amount of oil as well as air which is necessary to heat a given number of rivets per day. It is said that the economy effected in oil consumption makes an oil tank of more than 10 gallons capacity unnecessary, which is sufficient oil to heat all the rivets one man can drive in a day. This feature helps to make the forge light in weight. By means of two folding handles it may be conviently carried around by two men.

There is an automatic safety valve in the upper portion of the tank which permits air to enter the tank in normal operation to equalize the pressure. This valve closes automatically should the forge be tipped over in any way, preventing oil being wasted or thrown out over the men or adjacent property.

Three-Cylinder Pneumatic Flue Welder

A COMBINATION flue welder especially adapted for use in small railroad shops where there is not a sufficient amount of work to keep both large and small welders in constant operation, is being exhibited by the Scully Steel and Iron Company, Chicago.

Primarily designed for the small shop, the ideal com-



The Draper Combination Flue Welder is Especially Adapted to the Small Shop

bination of the Draper pneumatic flue welder is one such as illustrated, on which the welding and swedging of both small flues and large Superheater tubes can be handled at one furnace. Later on, as superheater work increases and separate furnaces are provided the frames can be mounted on separate bases.

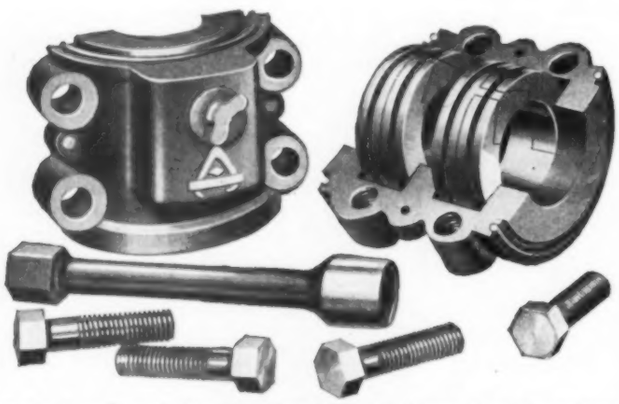
Several different combinations of frames can be used and all are interchangeable. Two double cylinder frames may be mounted on the same base, so that a number of light swedging operations may be performed at one heat, or for heavy swedging, two of the large single cylinder frames may be used in the same manner.

An All-Metal Air Pump Packing

WITHIN THE last month a new all-metal packing has been introduced for use on locomotive air pumps. This particular packing can be applied to any type of pump without change in its construction. The new packing is different in design from other types and a much longer life is claimed for it by The Garlock Packing Company, Palmyra, New York, which is responsible for its development.

Oil cups, oil swabs and vibrating cups are entirely eliminated in its construction. Lubricant is fed to the rod and packing rings from an oil reservoir which is cast as part of the split case surrounding the rings and any excess of oil fed to the packing rings will not be wasted because it gravitates into the cylinders of the pump. The packing rings, two in number, are constructed with mechanical accuracy from four segments which break joints in the center of the rod bearing surface. Each of the four segments travels or wears toward the center of the rod over a flat, smooth surface and under an even circular spring pressure. Ordinarily, one ring is sufficient to hold either the steam or air pressure on locomotive air pumps.

The construction of the new packing is such that the air ring will aid the steam ring in holding steam and the steam ring will aid the air ring in holding air. The combination of the two rings working in unison, will prevent the leakage of either steam or air. The wide bearing surface each ring has on the rod and the grooves of the case insures long life.



Both Steam and Air Cylinder Rod Packings Are Contained in One Case

The metal case surrounding the rings is split or made up in two separate halves and held together with screws large enough to prevent any leakage between the halves. It is also designed to hold one ring firmly in each of its two separate grooves.

The means of holding the metal packing in position is not the least of its new features. On each end of the case is turned a short projection which is used as a guide in centering the case with the rod and the stuffing box.

This centering is accomplished by entering this projection into the recess turned into the bore of the screw lock nut fitted on the threads on the outside diameter of the stuffing box. As these lock nuts are tightened, they are brought into contact with a copper gasket embedded in each end of the case and when properly seated with a spanner wrench, supplied by the manufacturer, they perform a double duty of rigidly holding the packing in alignment with the rod and forming a metal gasket seal as well.

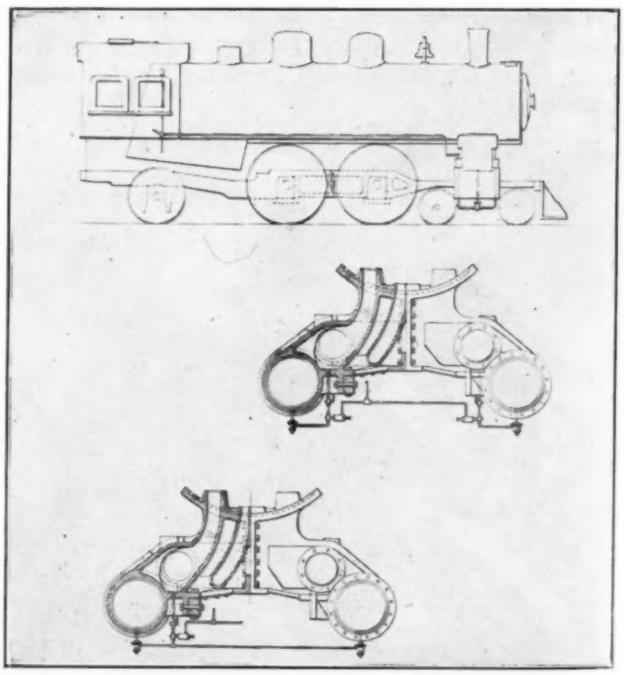
The split case entirely encloses the rod, making it impossible for dust or grit to reach the rod or packing. It also gives accessibility for the quick application of renewal rings.

Locomotive Cylinder Drainage System

THE DIEL-MORE SALES COMPANY, INC., Philadelphia, Pa., is exhibiting a new system of drainage and pressure relief for use on locomotive cylinders, consisting of an automatic cylinder drain and relief valve, power operated remote control valve and an engineman's operating valve. The drawing shows the arrangement of valves and piping.

The automatic drain and relief valve operates by steam pressure, the valve operating opposite to the movement of the throttle; i. e., when the throttle is open, the valve is closed, and when the throttle is closed, the valve is open.

As this valve always stands wide open when the throttle is closed, all condensation forming in the steam chest and cylinder will drain through the valve, and as it is designed without trapped points, perfect drainage is assured. When the throttle is open, the water is ejected whenever the pressure between the piston and cylinder head overbalances the pressure on top of the disk. This overbalancing pressure is far below the danger line and is fixed by the ratio of the area of the top of the disk to the area of the drain port opening, preventing excessive pressure on piston rod packing and cylinder head. As the valve opens when the throttle is closed, it will be



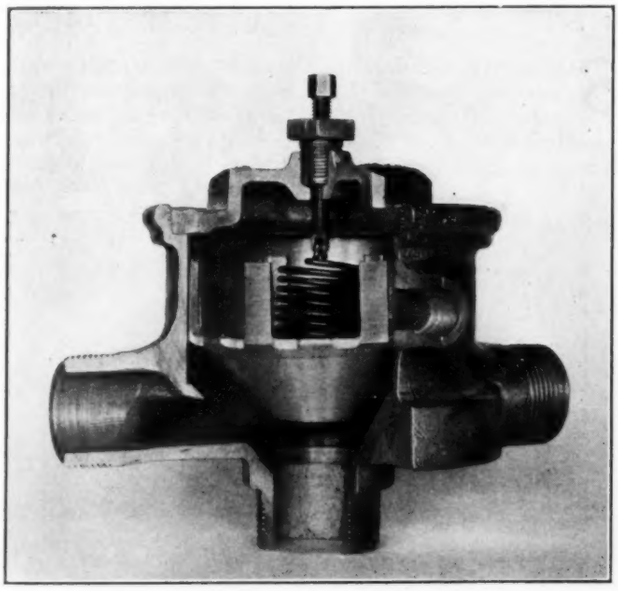
Drawing Showing Application of Diel-More Cylinder Drainage System to Locomotive Cylinders

open when the locomotive is drifting, making a direct by-pass through the valve from end to end of the cylinder, partially relieving the vacuum, preventing cold air from being drawn in, and securing better lubrication by retention of the oil.

The body containing the valve seat is one piece of close grained hard cast brass. The blunt conical disk is cast monel metal. The disk supporting spring is drawn monel metal. The valve seat is a standard 45 deg. blunt conical. The design produces a scouring effect just prior to closing, always leaving the seat clean and preventing dirt, bits of scale, metal chips, etc., from lodging on the faces. The seat and disk can be easily and accurately refaced by regrinding with a tool support grinder.

The spring adjustment required to meet various pressures is secured by simply turning a screw projecting through the top of the valve. Should the spring break, the valve closes. Its automatic drainage only is lost; the relief drainage is not affected.

Used as cylinder cocks, these valves may, if desired, be connected off the center line of the cylinders, providing protection against damage and securing greater ground clearance than is possible with hand or power operated cocks.



The Operation of the Drain Valve Is Either Automatic or Can Be Controlled from the Cab

This valve is manufactured with one, two, three or four drain ports, the sizes ranging from ¼-in. to 1¼-in. pipe size.

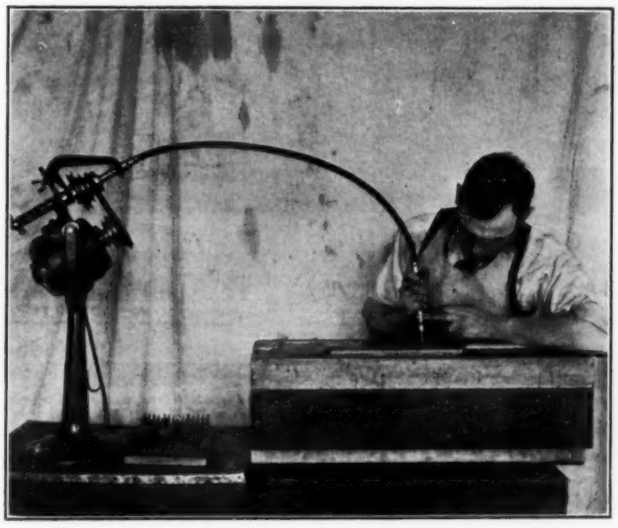
The remote control valve is used to shut off the steam pressure operating the drain and relief valve, to exhaust the pressure from above the disk so that it may open while the throttle is open and the cylinder is taking steam. The operating power is either steam or air as desired. The valve drains itself, together with the connecting piping, of all condensation, if properly pitched. It must be located at or near the drain and relief valve in the line forming the connection between the steam chest and drain and relief valve steam inlet.

The remote control valve is operated by an engineman's operating valve which may be installed for either hand operation or for foot operation with steam or air pressure.

A New Flexible Shaft Grinder

ONE OF the most adaptable machines exhibited, despite its small size, is the flexible shaft grinder recently brought out by the Keller Mechanical Engineering Corporation, Brooklyn. Besides grinding, the machine can be applied to a number of operations such as polishing, buffing, lapping, burring and drilling. The illustration shows the bench machine finishing the impression in a die block.

The driving motor is so mounted that it can be swung to any position, as it can be tilted in its bracket, which can swivel on the stand. The motor thus automatically adjusts its position to suit the position in which the operator places the handpiece. The shaft consequently takes an easy curve without sharp bends or kinks, for which reason shaft breakage is practically eliminated. Speed changes are made by means of a vee-shaped belt running on four-step cones, providing speeds from 875 to 3,500 r. p. m. By means of an eccentric, easily operated by a ball lever, the shaft driving cone can be moved toward or away from the motor cone, and then clamped in position by the wing nut. This feature makes it easy to shift the belt and to keep it at the proper tension. Cool running and a saving of power result from the fact that all rotating parts are mounted on ball bearings. The handpiece is fitted with ball bearings for which an adjustment is provided. For very high speed work, such as driving small grinding wheels, a special high-speed handpiece is made. Speeds three times those of the shaft are thus obtained, which means that the spindle can be driven at 10,000 r. p. m. A spring collet chuck in the end of the handpiece serves for holding burrs, shanks and mandrels of grinding wheels. Some equipment can be screwed directly on the end of the spindle. The use of burrs is constantly becoming more popular because it saves the time required for filing and riffling. A variety of types of burrs are finished with the machine. Besides the usual grinding wheels, buffers and soft wheels can be supplied. The tool in use in the illustration is a flexible polisher with which an abrasive paste is employed.



A Small Grinder Applicable to Many Uses

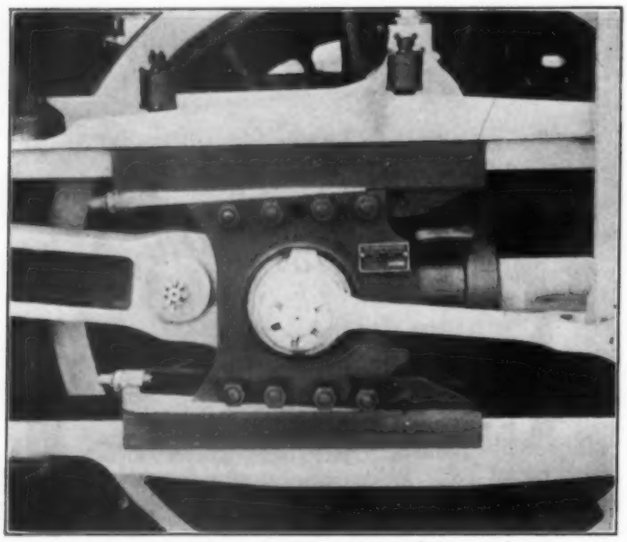
Besides the small ¼-hp. machine for bench mounting, a ½hp. machine mounted on a pedestal equipped with rollers, is also made.

Adjustable Crosshead Gives Long Service

THE ROGATCHOFF Company, Baltimore, Md., is exhibiting a crosshead shoe which is an interesting example of the influence of improvement in design on the proper maintenance of locomotive parts. This shoe was removed from a Baltimore & Ohio passenger locomotive after 127,041 miles of road service.

The crosshead on the left side of the locomotive was equipped with the Rogatchoff crosshead adjustment, a wedge and screw device which takes up vertical wear in the crosshead shoes, by turning the adjusting screw with a small wrench. This operation requires only a few minutes as compared with the hours of time and other expense required to remove and re-line a shoe of the ordinary type.

The shoe exhibited was applied April 15, 1921, and removed March 13, 1924, and during this entire period of thirty-five months, the only attention required was to turn the adjusting screws, thus taking up the wear without the removal of the shoe from the crosshead. At the time of removal the adjustment had progressed little more than two-thirds of its total length, and it was estimated that at least 30,000 miles additional service could have



The Wedge and Screw Adjustment of the Rogatchoff Crosshead Keeps It in Alinement Through Long Periods of Service

been obtained, the shoe being removed only for the purpose of exhibition.

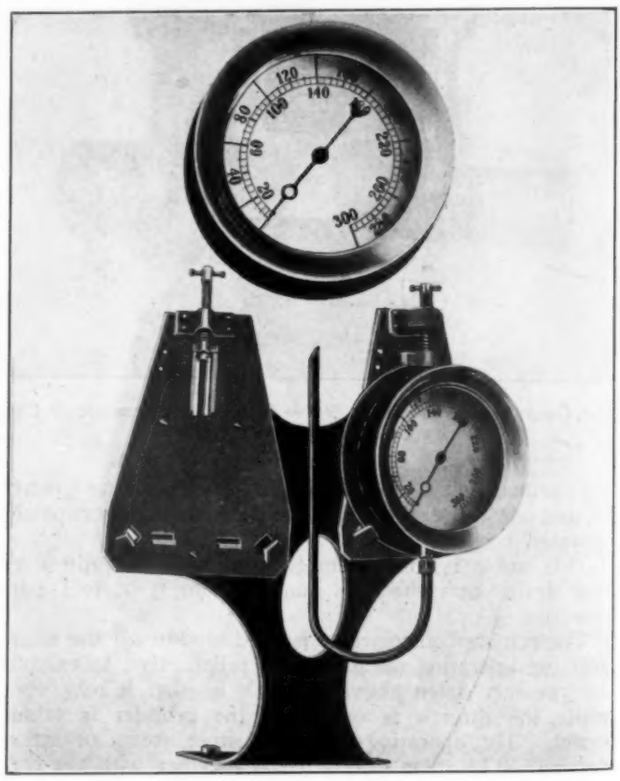
On another Baltimore & Ohio locomotive, a comparison was made of the service rendered by a crosshead equipped with the Rogatchoff adjustment and one of the older non-adjustable type. The adjustment was applied to the left side of the locomotive on April 29, 1921. From that time to June 1, 1922—fourteen months—the locomotive traveled 82,919 miles, and only turning of the adjusting screw was necessary to keep the crosshead in proper contact with the guide. During the same period, however, the crosshead shoes on the right side of the same locomotive, without the adjusting feature, were renewed six times.

Other repairs which are affected by the crosshead condition show a corresponding difference. On the side equipped with the adjustment, only one set of piston rod packing and one set of cylinder packing rings were renewed, and the main and front brasses were closed only twice. During the same time, repairs to the right side, without the adjustment, included two sets of piston rod packing, two sets of cylinder packing rings, one main brass and two front brasses renewed, guide yoke bolts renewed, guide bars taken down, trued and re-lined. In addition to these repairs the main and front brasses required closing five times.

This crosshead adjustment is now in use on more than 400 locomotives in the United States and Canada. On one railroad each one of a group of fifteen Pacific type locomotives has traveled more than 100,000 miles without attention to the crosshead shoes except to keep them properly lubricated and turning the adjusting screws as required. Similar service is being obtained on other types of locomotives, including switching locomotives, and heavy freight locomotives of the Mikado, Santa Fe and Mallet types.

A Holder for Steam and Air Gages

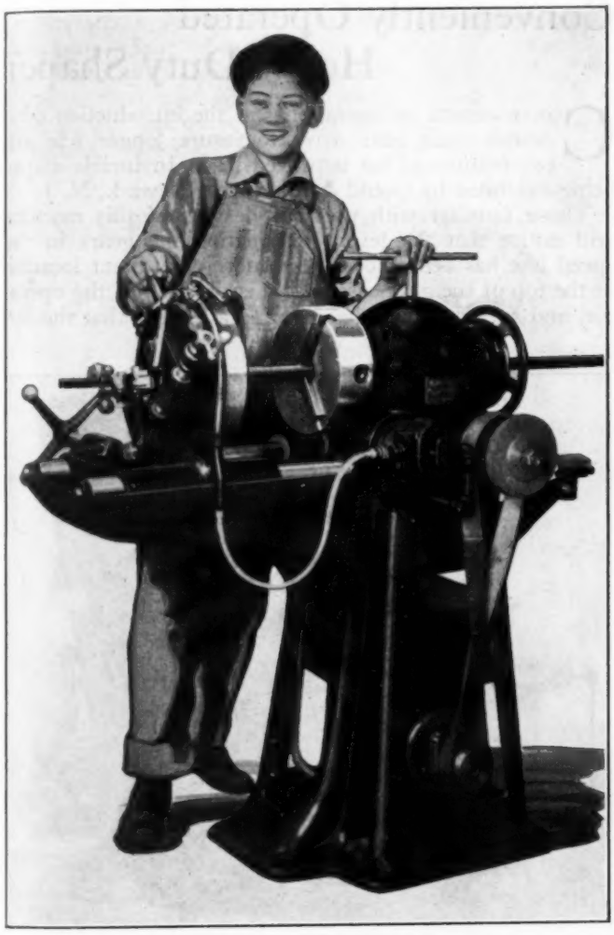
SIMPLICITY AND durability in construction are the outstanding features of the Swanson gage holder being exhibited by the United Manufacturing & Sales Corporation, Denver, Col. This device is so designed that it may be applied to any bracket now in use on a locomotive for supporting steam and air gages. A 5/8-in. bolt, which is automatically locked by a coil spring, holds the gage rigidly in such a position that space is provided for free circulation of air back of the gage. No tools are required to apply or remove the gages.



Gages are Rigidly Supported and Freely Ventilated by the Swanson Holder

Portable Machine for Cutting and Threading Pipe

CUTTING, THREADING and reaming pipe by hand has always been considered a laborious and expensive operation in railway practice. The Williams Tool Corporation, Erie, Pa., has designed a portable pipe threading, cutting and reaming machine which has reduced the labor to a minimum and cut the time of operation. The principal features of this machine are that it is portable, demountable, has a self-contained grinder and three drives—by motor, by belt and by hand—besides a wide threading, cutting off and reaming capacity. The weight of the machine complete with the motor and all standard parts is 520 lb. It can easily be removed to any part of the shop or taken out on the job where work is to be performed.



Right or Left-Hand Threads Can Be Cut on Pipe or Bolts With This Portable Machine

The machine is demountable and it is said that it can be taken down in 2 min. 10 sec., and assembled in less than 4 min. The pressed steel oil trough and cutting pan under the carriage can be lifted off, allowing the carriage and head to slide off the ways. The ways are made of seamless steel tubing ground to limits of plus and minus .01 in., which can also be pulled out of the headstock by slackening two tension screws, which leaves only the pedestal and the head stock as a unit.

A one-horsepower motor is mounted on a hinged table in the base of machine and the power is transmitted by belt to the flanged driving pulley. A distinctive feature is the method of raising the motor to release the belt and stop the machine. The demountable hand crank is used for this purpose, which is located in a handy position for the operator. An automatic belt adjustment is provided to compensate for the stretching of the belt, which protects the die and motor. When it is desired to stop the machine to change the pipe or inspect the threads, the lever can be thrown over and locked, thus eliminating the necessity of shutting off the current to stop the machine. Fifteen feet of heavy insulated extension cord with plugs is furnished with each machine, which enables the operator to plug in from any ordinary lighting circuit. The machine can be converted to belt drive simply by removing the motor belt and driving directly from a line or countershaft. Provision is also made for operating the machine by hand. It is only necessary to shift the gears to neutral position when the demountable crank handle can be fitted direct to the worm shaft. This shaft is direct connected to the spindle through a worm and worm wheel with a ball thrust which operates in oil.

The capacity of the machine makes it possible to cut either right or left hand threads on pipe ¼-in. to 2-in., and on bolts from ⅜-in. to 1½-in., inclusive. The machine will ream the inside and chamfer the outside of the pipe, inclusive from ¼-in. to 2-in. The longest run of thread at one chucking is 10½-in. By using a flexible shaft it will operate hand stocks up to and including 8-in.

The spindle has two speeds, arranged in a manner similar to automobile sliding gears, which also provides for a neutral position so that the spindle may be started and stopped without shutting off the current. The spindle is made of heavy seamless steel tubing ground to size and has 2⅞-in. bore, which allows a 2-in. coupling to pass through it. On the rear of the spindle there is a standard Williams three-jaw, self-centering scroll chuck for centering long pieces of pipe which is operated by a hand wheel. All gears are made of steel, machine cut, heat treated and run in oil. The shafts are of large diameter and equipped with long, hard, babbitted bearings provided with a self-oiling system.

The carriage slides are made from heavy seamless steel tubing. They are ground to size and higly polished, insuring a hard, durable surface. The way nearest to the operator has gear teeth milled on its surface, which engages a pinion shaft for operating the carriage. The die head and carriage are cast in one piece thus eliminating any possible change of the head getting out of alinement. The carriage has six bearings on the ways, three on each side, which are lined with hard babbitt.

The dies are interchangeable and operated by a cam and lever and are graduated, making it unnecessary to use a blank gage for setting the dies. Whenever several pieces of the same size are to be threaded a cam stop is used to set the cam lever at the right place for this particular size. The dies expand far enough to permit the pipe with coupling to pass through to the cut-off tool without touching the dies. Four sets of dies are furnished with the machine as standard equipment, one set cutting ¼-in. and ⅜-in.; the second ½-in. and ¾-in.; the third, 1-in. and 1¼-in., and the fourth, 1½-in. and 2-in. To change the dies it is only necessary to loosen two nuts on the face of the die head so that the die plate can be shifted slightly and lifted away from the head.

The cut-off attachment is mounted on the rear of the die head and operated by a screw and hand wheel. A V-block equipped with hardened tool steel facings steadies the pipe when cutting off. The cut-off blade is a double bevelled, high speed steel tool, set at an angle

which gives a natural clearance when cutting off all sizes, allowing the machine to be run at high speed for all cutting off work. The reamer holder, operated by a lever, is pivoted on the cut-off attachment.

A rotary, geared oil pump is located on the rear side of the machine and gear driven direct from the intermediate shaft.

The oil is pumped from a reservoir in the base of the machine and passed through a strainer to the pump, from there it is forced through a flexible hose to the die head where a three-way valve enables the operator to regulate the flow of oil from the dies and the cut-off tool. After flushing the dies and cut-off tool the oil drains back into the oil or chip pan under the die head and is then strained before it flows back into the reservoir.

A special feature of this machine is a high speed emery wheel which is mounted on the pulley shaft at the rear of the machine and driven direct from the motor. The wheel is set at such a height above the floor as to be most convenient to the operator. The machine is so designed that when the operator uses the emery wheel no other part of the machine is running except the motor and wheel, giving him the full power of the motor for grinding purposes. It is 6-in. in diameter with a ¾-in. face and runs at about 1,100 r.p.m.

Stoker for Narrow Firebox Locomotives

THE LOCOMOTIVE STOKER COMPANY, Pittsburgh, Pa., is exhibiting a new type of locomotive stoker, known as the type L-1, which was designed for firing locomotives much smaller in size than those ordinarily equipped with mechanical stokers in the United States. It was intended primarily for use on locomotives of foreign railways, where a stoker smaller than the Duplex was necessary.

The stoker is designed with a shorter stroke than the type D-1 stoker to afford ample clearance on narrow gage locomotives. The single elevator feature is adapted to firing locomotives with long narrow fireboxes. The shallow conveyor trough is also a desirable feature where clearances are restricted on the tender between the tender frames and bottom tank sheets.

The driving engine consists of a cylinder 18 1-8 in. by 9 1-2 in. in diameter, with cylinder head and valve mechanism similar to that of the Duplex type D-1. The piston has a 13 3-4 in. stroke. The piston rod is connected to a drive rack of square cross section with teeth on the top surface which mesh with a driving gear keyed to the main driving shaft. At the front end of the drive shaft is a bevel gear which meshes with a similar gear at right angles which is keyed to the elevator drive shaft. At the top of the elevator is a ratchet and pawl arrangement for holding the elevator pawls in drive, neutral and reverse. At the rear of the main drive shaft is a similar ratchet and pawl arrangement for controlling the conveyor screw, to which the main drive shaft is connected by a series of two universal joints, a flexible and a rigid drive shaft along the left side of the conveyor trough, and two bevel gears at the rear of the trough.

The conveyor and elevator screws operate on the forward stroke of the driving engine and remain stationary on the return stroke unless reversed by the ratchet and pawl arrangements.

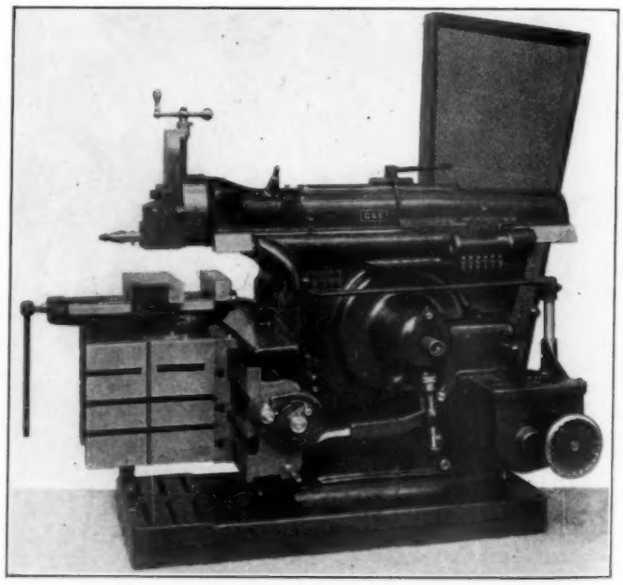
The coal distributing mechanism at the top of the single elevator consists of an elbow and combination distributor jet and tube. The distributor tube enters the firebox to the left of the firedoor at a slight angle and the steam jet openings are at varying angles so as to blow the coal evenly over the grate area.

The coal from the tender enters the conveyor trough and is carried forward by the conveyor screw through the coal breaker into the transfer hopper. From this hopper it is raised by the elevator screw to the distributor elbow and into the distributor tube, from which it is blown into the firebox by the low pressure steam jet.

Conveniently Operated Heavy Duty Shaper

CONVENIENCE OF operation and the introduction of a double train gear drive to insure longer life are two features of the improved 32-in. Invincible shaper being exhibited by Gould & Eberhardt, Newark, N. J.

Those familiar with previous designs of this machine will notice that the lever for shifting the gears in the speed box has been moved to a more convenient location at the top of the gear case within easy reach of the operator, and an index plate has been so arranged that the operator can easily read the number of strokes the machine is making. The movable vise jaw now has a solid top; a clamp has been provided for locking the tool head side to prevent it from feeding down, and oil wipers are furnished on the crosshead slide to prevent chips and dirt from working in between the slide and the cross rail and marring the ways.



Centralized Controls are a Feature of this 32-in. Shaper

A centralized multiple gravity oiling system has been incorporated in the machine to lubricate properly the internal main bearings, as well as a new oiling arrangement for the crosshead slide.

Three other improvements are a disk clutch, new design of pulley shaft and drop forged instead of cast iron handles on practically all controls.

The Chisholm-Moore Beam Trolley

A NEW BALL-BEARING, oscillating type I-beam trolley has been announced by The Chisholm-Moore Manufacturing Company, Cleveland, Ohio. The distinctive features of the trolley are the ball bearing pressed steel wheels, steel frames and light weight.

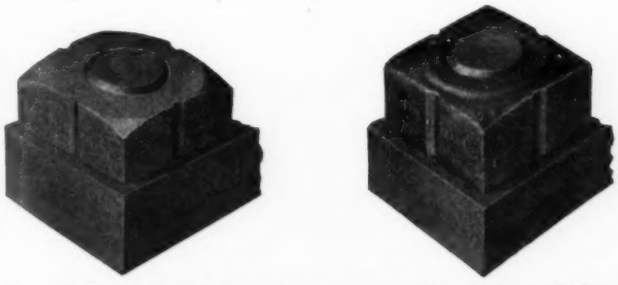
The wheels have the bearings built in, making one unit. They are adaptable to any size I-beam from four to seven inches by a simple shifting of the separator washers. The frames are made of steel and can be used with all makes of chain blocks and hoists. The frames have an oscillating feature which prevents unequal strain and distributes the load on all four wheels.

The trolley is simple in construction having only eight parts, exclusive of washers, cotter pins and nuts. It is built in one size only, to handle loads up to one ton and weighs complete 17½ lbs.

Two Lock Nut Developments

THE AMERICAN BOLT CORPORATION, Boss Nut Division, Chicago, has developed two lock nuts, designated as Boss holding lock nut No. 2 and Boss unit lock nut No. 3 which are unique in that they depend upon friction for a locking hold without distortion or change of the pitch of the threads. These two lock nuts, added to the well-known lock nut which they have manufactured during the past 12 years and which is now designated as Boss lock nut No. 1, will enable manufacturers to meet the demand for holding and unit lock nuts as well as auxiliary or jamb nuts.

The new Boss holding lock nut No. 2 is a cold punched



Boss Holding Lock Nuts Nos. 2 and 3 Are Cold and Hot Punched, Respectively, and Are Furnished Either Square or Hexagon

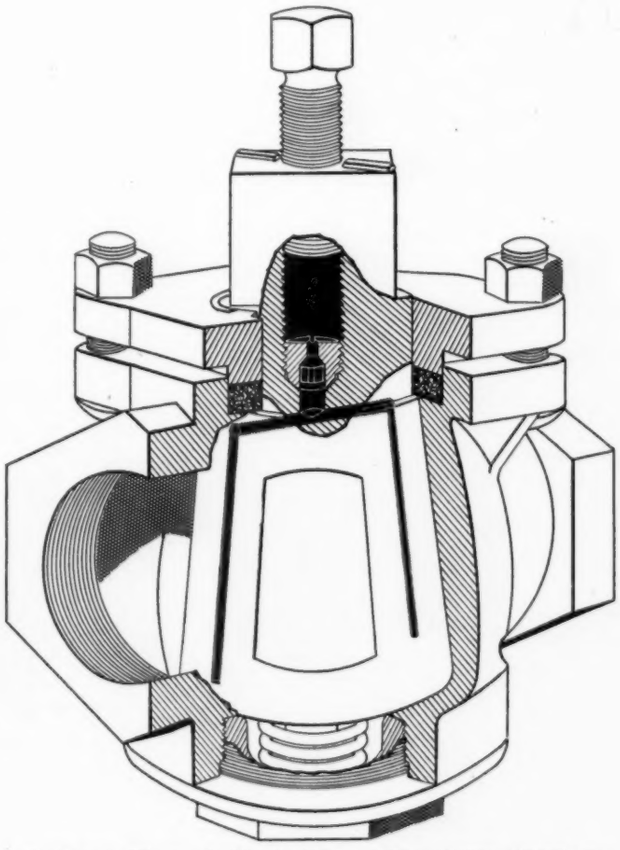
nut having the same dimensions as common shop nuts of the same size. The No. 3 nut is a hot forged nut and conforms to the same dimensions as U. S. S. hot forged nuts of corresponding size. The No. 2 nut is made both square and hexagon in sizes ranging from ¼-in. to ¾-in. while the No. 3 nut ranges from ¼-in. to 2-in., also square and hexagon.

Both of these lock nuts have been invested with the same locking feature. While they depend on frictional contact with the bolts for their lock, the pitch of the threads has not been disturbed. They may be started on the bolts with the fingers. After two or three turns they begin to bind and it is then necessary to complete the application with a wrench. These lock nuts are applicable to such bolts as may be secured against rotation while the nuts are being applied. But, owing to the fact that the pitch of the threads has not been disturbed, there is no danger of injury to the threads of bolts to which they may be applied. Only enough frictional locking power has been put into the nuts to prevent them from working loose through vibration and shock.

Martin-Barco Lubricated Plug Valve

THE BARCO MANUFACTURING COMPANY, Chicago, has developed a plug valve with a lubrication feature for use in railroad enginehouses, shops and yards. This valve is tight against leakage and free turning. Regrinding is practically done away with, which extends the field of plug valves, with their desirable features, to new uses in railroad service.

This plug valve is lubricated in a very simple manner, lubricant being forced down grooves between the plug



Sectional View of Martin-Barco Plug Valve Showing Method of Lubrication

and seat by a compressor screw in the top of the wrench square, as illustrated, so that every time the plug is turned to open or close the cock, the lubricant is spread over the surfaces. The character of the lubricant used has been given special consideration so that it will adhere to the plug and seat surfaces in a thin film even under temperatures in excess of 500 deg. F., thereby making possible the general use of the valve for cab work on boiler heads, in enginehouses for steam and hot water boiler washing and filling lines and blower lines, as well as for steam, air, gasoline, kerosene and fuel oil lines in shops, yards and terminals.

In addition to the lubrication of the plug and seat, this

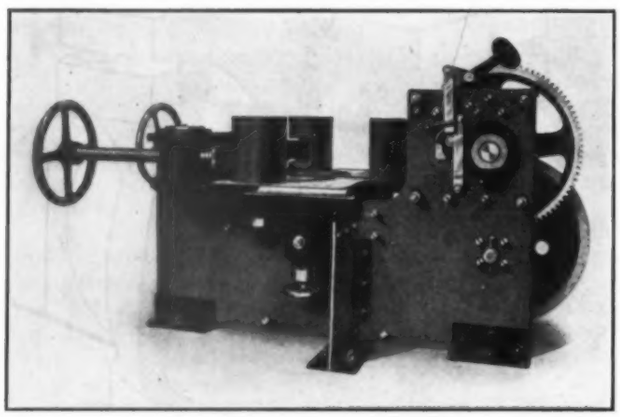
valve is gland packed at the top, a hydraulic moulded gasket ring being used which not only gives long service but is readily renewable under pressure. The bottom is closed with a cap, thereby providing a plug valve which is closed on top and bottom against leakage and sealed on its plug and seat surfaces by a film of lubricant. A very small amount of lubricant is necessary and lubrication need be effected only occasionally.

This plug valve is made of special iron so that it is capable of withstanding the exacting service of locomotive boiler head valves equally as well as the more moderate railroad service pressures encountered in steam, water, air and oil lines.

Horizontal Eccentric Bending and Straightening Machine

A BENDING AND straightening machine adaptable to railroad car shops is being exhibited this year by the Henry Pels & Company, New York. The design and construction of this machine follow the lines of all the Pels punching and shearing machines, having heavy steel plate frames. They are made of high tensile steel which provides a high factor of safety.

The bending blocks move forward or backward on an arc, making their center distance short when near the ram head and lengthening when they recede. This movement automatically accommodates the varying uses of



The Pels Machine for Bending or Straightening Structural Shapes

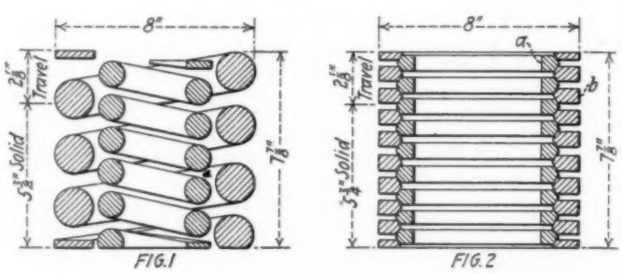
sections and lengths of radius. This arc line of travel of the bending blocks has been determined from the moment of resistance of various sections, figured theoretically and combined with the results of actual tests. The shape of a section and its moment of resistance should have rather more consideration than the weight.

All the gears are steel with teeth accurately cut from the solid. The pinions and shafts are forged. The bearings are of liberal dimensions and are fitted with phosphor-bronze bushings. The main shaft bearings are the ring oiler type. The table is wide and substantial with a horizontal roll on each side to facilitate the handling materials.

The bending blocks are adjusted independently of each other by hand wheels and screws that move them in the arc grooves. In bending a beam, the blocks are adjusted toward the ram head until the bending is started. The blocks are then further adjusted until the desired curve is secured. Any length can then be run through the machine as far as necessary. The center distance between the blocks decreases as the blocks are adjusted toward the head of the ram. There is but little danger of overloading the machine as the beam losses part of its resistance as soon as a slight bend is made.

A Ring-Type Spring

A NOVEL AND interesting exhibit is that of a spring composed of rings which is being shown by Robert H. Blackall, New York. As illustrated in Fig. 2, the spring consists of inner and outer solid rings, a and b, which fit into each other along conical surfaces. When axial pressure is applied, the outer rings are subjected to tensile stresses and the inner rings to compression stresses, always within the elastic limit of the material. On account of the deformation of the rings, they slip into each other and a spring action in the direction of the longitudinal axis is obtained. The relative motion of the rings is opposed by friction between the conical surfaces, which materially increases the spring reaction during compression and exerts a retarding action during the recoil. In a ring spring corresponding with a Class G spring, the frictional surface is 88 sq. in. when fully compressed.



COMPARISON OF COIL AND RING TYPE SPRINGS

	Class G	Ring spring
Weight of spring, lb.	55	40
Ultimate resistance, lb.	30,360	88,000
Maximum recoil force, lb.	30,360	30,000
Work done during compression, ft.-lb.	2,680	7,460
Work done during recoil, ft.-lb.	2,230	2,540
Work absorbed by spring, ft.-lb.	450	4,920

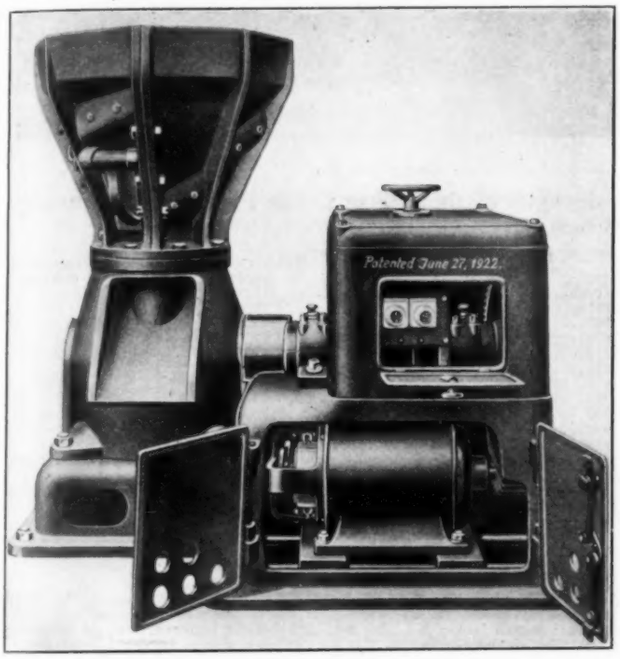
Drawing Showing Comparative Dimensions of the Standard Coil and Ring Type Springs

The capacity of the spring is largely determined by the angle of the friction surfaces. These have been determined after exhaustive tests and are such as will give maximum resistance. At the same time the angles are such as to insure a positive release. With about two-thirds of the weight of the usual spiral type of spring, it takes three times the power to compress it solid and has practically the same amount of recoil as the corresponding spiral spring. The foot-pounds of work done is practically three times that of the spiral spring and the work absorbed is over ten times as much.

A feature of this spring is that part of this work is consumed by friction while part is stored in actual stretch of the outer ring and compression of the inner ring. Of this stored work only a part is returned during the recoil period, while the balance is absorbed in friction. If breakage occurs by any chance, owing to a poor section, it is necessary to renew only one ring instead of a whole spring.

Crusher For Chip and Turnings

A MACHINE FOR crushing and cutting metal chips is being exhibited by the American Crusher & Machinery Corporation, New York. In this device, the turnings are thrown into a hopper at the top of the machine, where they are caught by the arms of a revolving cutter head and are pulled down in the funnel-shaped opening. Here they are cut repeatedly between revolving knives in the cutter head and fixed knives on the walls



This Machine Cuts and Crushes Metal Turnings

of the machine. These knives are arranged in a spiral, so that the cuttings are constantly drawn downward into the neck of the funnel where the final reduction is made between fixed knives and moving knives on a rotating knife-head.

It is possible by adjusting the position of the knives to regulate the size of the delivered chips as desired. The only parts subject to wear and replacement are the knives, which are of hardened steel and may be expected to last several years. They are easily removed and replaced at small cost.

Safety devices are incorporated within the machine, which automatically stop the cutting mechanism when a big piece of scrap, a tool, or other obstruction enters with the turnings, doors being provided in the side of the hopper for the removal of such obstructions. Small pieces, such as bolts and nuts slide down along the spirals of the hopper and are cut down gradually so that the machine is not stopped by them.

This machine is available in two sizes. The smaller size has a capacity of about ½-ton per hour and requires about four horsepower. It can be arranged for either belt or motor drive, or as a self-contained motor-driven unit with all controls incorporated. The larger size machine handles about five tons per hour, requires about 15 horsepower and is arranged for belt drive only.

The spring shown in Fig. 2 has the same outside dimensions as the standard M. C. B. Class G spring, shown in Fig. 1 and weighs considerably less, but requires about three times more work for its compression.

In the ring-type spring an inner, or compression ring, rarely fails. If an outer, or tension ring, should fail, the capacity of the spring as a whole is simply reduced proportionately.

Lubrication usually produces a decided drop in frictional resistance. Greasing the ring spring sections produces very little difference in the resistance; in fact, it is an improvement as possible wear and corrosion is reduced to a minimum.

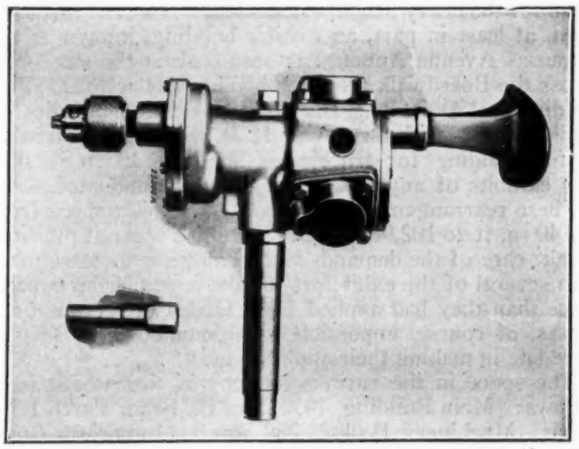
A ring spring applied to the tender draw-gear of a switching locomotive was found to be in excellent condition after six months of service and the change in overall dimension was only 0.04 in.

A Light-Weight Pneumatic Drill

A NEW SIZE light-weight non-reversible pneumatic drill is being exhibited by the Ingersoll-Rand Company, New York. This new drill is known as Size "D" and is suitable for light drilling up to $\frac{9}{16}$-in. diameter holes, and reaming up to $\frac{5}{16}$-in. diameter.

The drill may be fitted with either a breast plate, feed screw or grip handle and can be adapted to a wide variety of work. The construction of this machine is similar to that of the No. 6 and No. 600 drills which this company brought out about two years ago and which were powered for drilling up to $\frac{3}{8}$-in. diameter.

The features of this type of machine are briefly—light-weight aluminum case, with steel bushings cast in all



The Ingersoll Rand Size D Pneumatic Drill

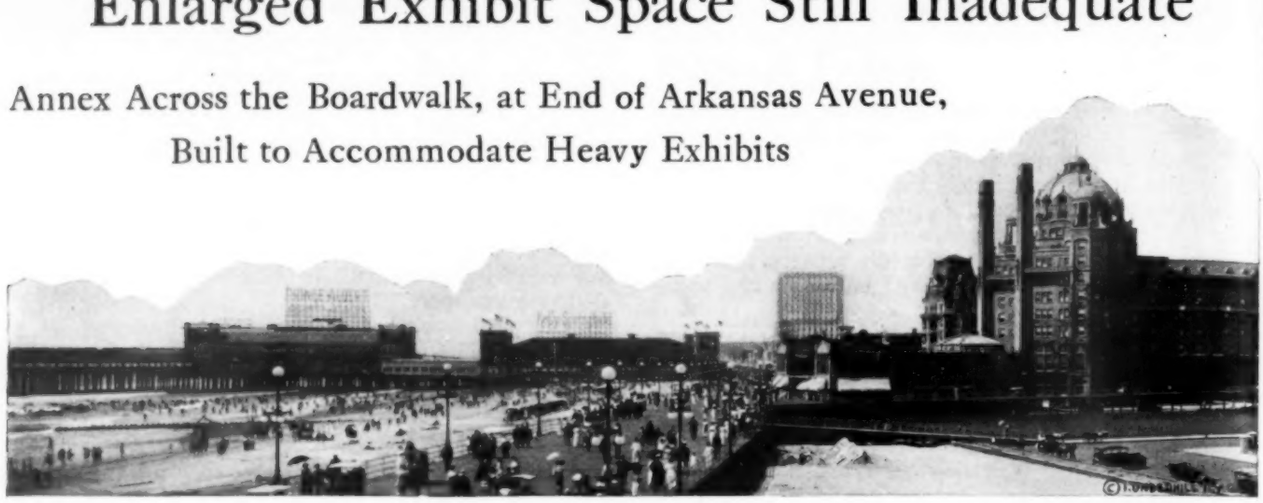
the bearing holes and the throttle hole; cast iron cylinders which are renewable and interchangeable and a special three-cylinder motor. The renewable cylinders are a valuable feature, as any cylinder, after long service, may easily be replaced and the motor made as good as new at slight cost.

The rotating parts of the three-cylinder motor are all accurately balanced, thus eliminating vibration and reducing wear and tear on the machine.

The drill is economical in air consumption and cost of maintenance, is high powered, and every part is readily accessible for inspection.

Enlarged Exhibit Space Still Inadequate

Annex Across the Boardwalk, at End of Arkansas Avenue, Built to Accommodate Heavy Exhibits



THERE ARE several noteworthy features about the Exhibit this year which will be of interest to those who have followed the steady and remarkable development in this respect in recent years. In the first place, the Exhibit Committee, when it came to make assignments, was very much embarrassed because the demand for space so greatly exceeded that which was available. Certain additions were made to the exhibit space to help in some small degree to meet these requirements. The Annex, for instance, was extended to include the space south of and alongside Convention Hall. The depth of exhibit spaces 4 to 30 on the east side of the main building was increased by nine feet.

The greatest embarrassment, however, was caused by the fact that Machinery Hall proved to be entirely inadequate for the heavy machinery exhibits. To meet this situation, at least in part, an exhibit building, known as the Arkansas Avenue Annex, has been built at the street-end across the Boardwalk from the Million Dollar Pier. This building is 120 ft. long and 30 ft. wide, and includes 13 exhibit spaces, with a run-way 12 ft. wide on the east side of the building for trucking. The foundation is such that exhibits of any weight may be accommodated.

These rearrangements increased the exhibit space from 95,140 sq. ft. to 102,988 sq. ft. Even this was not sufficient to take care of the demands, and arrangements were made with several of the exhibitors to take a smaller amount of space than they had applied for. Under these conditions it was, of course, impossible to accommodate those who were late in making their applications.

The space in the various sections of the exhibit is as follows: Main Building, 14,482 sq. ft., Front Porch 1,592 sq. ft., Machinery Hall 23,258 sq. ft., Aquarium Court 7009 sq. ft., Exhibition Hall 13,484 sq. ft.. Annex 39,203 sq. ft., Pier End 1,800 sq. ft., Arkansas Avenue Building 2,160 sq. ft.; total, 102,988 sq. ft. The above figures are, of course, exclusive of the space occupied by the track exhibit.

The most remarkable development this year, and it has been characteristic of the recent exhibits, is the growth of the machine tool exhibit. This section has a number of companies who are exhibiting for the first time, including many new appliances. It is doubtful if any other exhibition of any kind has ever included so large a number and variety of machine tools as are shown at Atlantic City this year.

The track exhibit on the Philadelphia & Reading track, at the Boardwalk and Mississippi Avenue (a few minutes' walk south of the Million Dollar Pier) is also unusually interesting.

Year	Exhibit space* sq. ft.	Number of exhibits
1910	71,019	...
1911	76,110	245
1912	83,507	262
1913	87,360	277
1914	82,218	266
1915	70,412	222
1916	76,643	258
1919	93,499	314
1920	100,061†	365
1922	96,000	341
1924	102,988	373

* Square feet of space actually paid for. Does not include free space to M. C. B. committee.

† Balcony used for exhibits in 1920. Practice discontinued in following years because of poor location.

List of Exhibitors

Adams & Westlake Company, Chicago, Ill.—Car lighting fixtures; Car door hardware; basket racks; white-Ajax metal washstands; postal car lavatories; switch locks; No. 250 Adlake kerosene lanterns; electric lanterns; flashing highway crossing signals; railway signal lamps. Represented by E. L. Langworthy, W. S. Hamm, William J. Pierson, A. S. Anderson, G. L. Walters and B. L. Compton. Space 655.

Air Reduction Sales Company, New York.—Airco D-B 2-A Oxygraph; Airco D-B radiagraph; Airco D-B 100-lb. acetylene generator; complete oxy-acetylene hand welding and cutting apparatus. Represented by E. M. Sexton, B. N. Law, R. T. Peabody, W. H. Ludington, W. W. Barnes, L. W. Hughes, W. H. Eliason, G. E. Phelps, I. W. Hicok. Spaces 639, 707, 708 and 709.

Ajax Manufacturing Company, The, Cleveland, Ohio.—New model forging machine with improvements; samples of forgings made by Ajax machine methods. Represented by J. R. Blakeslee, A. L. Guilford, J. A. Murray, H. D. Heman and W. W. Criley. Spaces 65 and 67.

Allegheny Steel Company, Brackenridge, Pa.—Complete line of ASCO journal box lids and truck spring plates. Represented by L. W. Hostettler and H. S. Brautigam. Space 553.

Aluminate Sales Corporation, Chicago.—Sodium aluminate for water softening and clarification. Represented by T. G. Windes. Space 670.

American Abrasive Metals Company, New York.—Feralun, Bronzalun and Alumalun structural safety car steps; safety car step treads; safety stair treads; safety platform plates. Represented by Ralph S. Edmondson and Ralph P. Spooner. Space 626.

American Arch Company, Inc., New York.—Security arch brick. Represented by LeGrand Parish, William L. Allison, John P. Neff, R. J. Himmelright, J. T. Anthony and George Wagstaff. Spaces 402, 414, 416, 422 and 424.

American Bolt Corporation, Chicago.—Boss lock nuts; bolts, nuts and rivets. Represented by J. C. Burns, J. D. Purcell, J. A. MacLean, J. W. Fogg, C. Beaumont, W. E. Burns, H. L. Harrison, A. F. McCoole and R. H. Hill. Spaces 370 and 371.

American Brake Shoe & Foundry Company, New York.—Brake shoes and brake heads. Represented by Fitz William Sargent, William B. Given, Jr., E. L. Janes, M. N. Trainer, T. S. L. Seaman, A. H. Elliot, F. H. Coolidge, R. E. Holt, William Minto and J. Thomas Talbot. Space 418.

American Car & Foundry Company, New York.—Passenger car seats. Represented by J. H. Weisbrod, T. M. Buick, W. C. Dickerman, W. E. Hedgcock, C. D. Eaton, W. A. Williams, V. R. Willoughby, A. E. Ostrander, M. H. Connelly, Horace Hager, W. F. Kingston, W. J. Harris, C. D. Terrill, L. W. Martin, F. C. Cheston, D. M. Knox and R. J. Smith. Space 2.

American Crusher & Machinery Corporation, New York.—American chip crusher, type SZ-15-E. Represented by L. S. Neushul. Space 657.

American Locomotive Company, New York.—Alco reverse gear; Lehigh Valley three-cylinder locomotive. Represented by D. W. Fraser, J. B. Ennis, L. S. Carroll, A. Hamilton, W. K. Farrell, H. Fulton, C. H. Apps, R. Rennie, C. M. Bell, J. G. Blunt, S. Miller, C. J. Mellin, S. F. Weller, J. Partington, A. W. Bruce, J. Kindevater, E. Duchesne, J. R. Magarvey, R. B. McCall, G. Gurry, O. L. Parsons, G. G. Jones, R. Anderson, E. O. Fisher, O. R. Hale, F. H. Reynolds, D. D. Cooke, G. P. Robinson, A. Haller and H. J. Downes. Space 614 and on exhibit track.

American Malleable Castings Association, Cleveland, Ohio.—Certified Malleable iron castings used in railway equipment construction; present day methods of testing the quality of malleable iron castings. Represented by Frank J. Eppele, Enrique Touceda and Robert E. Belt. Spaces 110, 112 and 114.

American Radiator Company, Buffalo, N. Y.—Typical Arcola installation for signal towers. Represented by H. H. Erickson. Space 203.

American Railway Appliances Company, Inc., New York.—Superior Locomotive flue blower. Represented by August Schneider, Lloyd D. Brown and F. J. Whelan. Space 406.

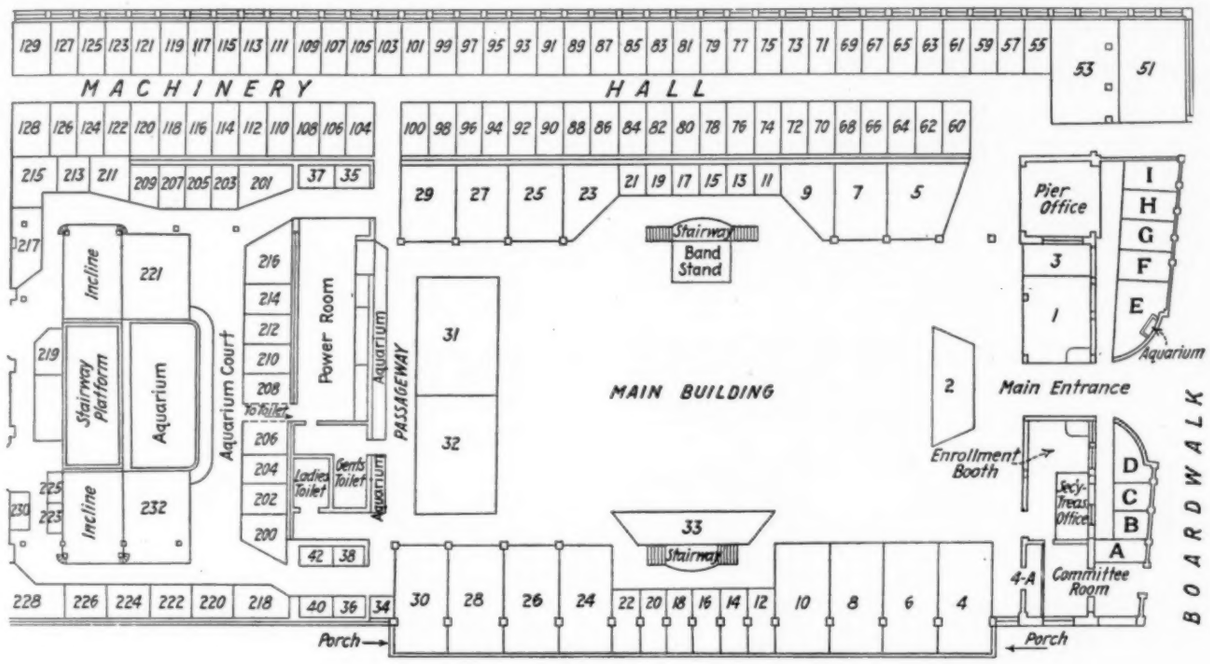
Association of Manufacturers of Chilled Car Wheels, Chicago.—Standard chilled iron car wheels, 650 lb., 700 lb., 750 lb. and 850 lb. Represented by George W. Lyndon and David F. Hoy, Jr. Space 134.

Atkins & Co., E. C., Indianapolis, Ind.—Hand, rip and panel saws; cross-cut saws; circular rip and cut-off saws; wide and narrow band saws; hack saw blades and frames; hack saw machines; metal band saw cut-off machines; circular knives; machine knives. Represented by E. S. Norvell, R. H. Hunter and E. W. Clark. Space 133.

Automatic Transportation Company, Inc., The, Buffalo, N. Y.—Industrial storage battery trucks and tractors; type LA elevating platform truck; T-L tiering-lifting truck; TA three-wheel tractor; CEA 3,000-lb. locomotive type crane truck; drive and lift units. Represented by W. C. Carr, E. L. Kleindinst, R. J. Mulholland and W. H. Mims, Jr. Spaces 301, 303 and 305.

B-S Manufacturing Products Corporation, Jersey City, N. J.—B-S automatic drifting valve; B-S quick action valve; B-S self-lubricating packing box; B-S gage cock. Represented by H. O. Wittpenn, R. W. Braden and Charles Stern. Space 704.

Badeker Manufacturing Company, Chicago.—Two-ring and one-ring piston packing; valve stem packing; renewable hub liner; air pump lubricating cup and locomotive bell ringer. Represented by J. P. McKinley and J. W. Stack. Space 651.



Arrangement of Exhibit Spaces at Boardwalk End of Pier

American Steel Foundries, The, Chicago, Ill.—Cast steel bolsters, side frames and couplers; Davis steel wheels; Simplex clasp brakes; Ajax and Hercules brake beams; couplers yokes; springs and miscellaneous steel castings. Represented by G. E. Scott, R. H. Ripley, W. J. Lynch, J. V. Bell, Theodore Cook, R. F. Darby, F. B. Ernst, George G. Floyd, W. R. Gravener, C. L. Heater, T. H. Hopkirk, L. E. Jones, T. D. Kelley, P. A. Martin, A. W. MacLaren, F. S. McNamara, A. H. Peycke, H. D. Richardson, G. F. Slaughter, W. S. Spieth, W. S. Stearns and W. G. Wallace. Spaces 149 and 151.

American Tool Works Company, The, Cincinnati, Ohio.—Special railway shop portable lathe, 16½-in. swing by 5-ft. bed; 24-in. by 12-ft. heavy pattern high duty lathe; 28-in. American heavy service shaper; 6-ft. triple purpose plain radial drill; 2½ ft. high speed ball bearing radial drill; 3-ft. triple purpose radial drill. Represented by J. C. Hussey, H. W. Schatz, L. W. S. Alter, F. L. Stubenroth and A. H. Koller. Spaces 55, 57, 59, 61, 63.

Anchor Packing Company, The, Philadelphia, Pa.—Air pump packing; throttle packing; sheet packing; asbestos products. Represented by J. P. Landreth, D. J. P. Murray, J. A. Hillborn, B. J. Miller and W. R. Haggart. Space 367.

Angle Steel Stool Company, Plainwell, Mich.—Caboose chair and other steel chairs. Represented by A. J. Sams. Space, part of E.

Armstrong-Blum Manufacturing Company, Chicago.—Marvel automatic high speed metal saw; metal band saw; hack saw machines; portable metal saws; punch, shear and bender. Represented by Harry J. Blum and G. L. Hunt. Space 140.

Ashton Valve Company, The, Boston, Mass.—Locomotive open pop and muffled safety valves; locomotive steam and air gages; wheel press recording gages; dead weight gage testers; locomotive driving wheel quartering gages; whistles; quadruplex, duplex and single air gages; test gages. Represented by J. W. Motherwell, J. F. Gettrust and H. O. Fettinger. Space 518.

Baker R. & L. Company, The, Cleveland, Ohio.—Electric locomotive crane; Hy-Lift truck; three-wheel tractor; elevating truck. Represented by M. A. Watterson, H. B. Greig, F. N. Phelps, Nathaniel Platt, De-Peyster Stagg and C. Davis Gilpin. Space 338.

Baldwin Locomotive Works, The, Philadelphia, Pa.—Photographs and general descriptive matter pertaining to locomotives. Represented by Grafton Greenough and A. H. Ehle. Space 625.

Barco Manufacturing Company, Chicago.—Flexible joints; flexible all-metal conduits, power reverse gears; crossheads and shoes; automatic smoke box blower fittings; lubricated plug cocks. Represented by C. L. Mellor, F. H. Stiles, A. S. Lewis, F. B. Nugent, W. J. Behlke and C. O. Jenista. Space 641.

Bassick Manufacturing Company, The, Chicago.—Alemite system for locomotives; main rod, Alemite equipped. Represented by J. H. Frier, Jr., and Peter Gresser. Space 664.

Bath & Co., Inc., John, Worcester, Mass.—High speed steel ground taps; internal micrometers; internal thread micrometers; high speed steel hobs; high speed steel thread rolling dies; Bath indicators. Represented by John Bath, J. Chester Bath and Frank E. Harrison. Space 668.

Besley & Co., Charles H., Chicago.—No. 41, 20-in. "L" direct connected motor driven disk grinder; Titan abrasive disks; Besly taps. Represented by Charles A. Knill, John F. Curns and L. H. Swind. Space 108.

Bethlehem Steel Company, Inc., Bethlehem, Pa.—Pressed and forged steel parts for freight and passenger cars; charcoal iron boiler tubes; special staybolt iron; rolled steel wheels; hollow-bored heat-treated axles; self-lock nuts; miscellaneous railroad specialties. Represented by G. W. Struble, R. V. Sage, D. Newhall, J. C. M. Des Islets, R. E. Wilder, C. W. Weaver, George A. Richardson, W. C. Cutler, H. C. Walton, J. M. Connors and G. H. Raab. Spaces 588 and 589.

Bettendorf Company, The, Bettendorf, Iowa.—Truck with U-section frames and Schaefer loop hangers; swing motion caboose truck; T-section side frame; center sill construction; model of truck. Represented by J. W. Bettendorf; E. J. Bettendorf; J. H. Bendixen, F. K. Shults, Peter P. Beck, C. J. W. Clasen, K. M. Hamilton, John Brady and William E. Bettendorf. Spaces 218 and 220.

Bird-Archer Company, The, New York.—Boiler chemicals; washout plugs; blow-off cocks. Represented by P. B. Bird, L. F. Wilson, J. A. McFarland, C. A. Bird, T. A. Peacock and H. C. Harragin. Space 31.

Blackmer Rotary Pump Company, Petosky, Mich.—Industrial rotary pumps. Represented by F. P. Goertz. Space 315.

Black & Decker Manufacturing Company, Towson, Md.—Electric drills, electric screw drivers and socket wrenches; electric bench and pedestal grinders; bench drill stands. Represented by Walter Ballard, Robert D. Black, R. W. Procter, R. E. Misener, W. C. Allen and F. P. Parish. Spaces 166 and 167.

Bowser & Co., S. F., Ft. Wayne, Ind.—94-A outfit and large photographs of recent railroad oil house installations. Represented by T. D. Kingsley, S. F. Taylor, E. M. Harshbarger and W. T. Simpson. Space 28.

Boye & Emmes Machine Tool Company, The, Cincinnati, Ohio.—20-in. coneless engine lathe. Represented by Manning, Maxwell & Moore, Inc. Space 70.

Bradford Corporation, The, New York.—Bradford rocker type draft gear; three-spring draft gear; type L draft gear; structural draft arms; Huntoon truck bolster; Huntoon brake beam; Joliet brake beam; Chambers front end throttle valve. Represented by Horace Parker, Burton Mudge F. K. Mays, H. F. Lowman, W. W. Rosser, Charles A. Carscadin, W. C. Doering, H. C. Priebe, George L. Kilmer, J. C. Keene, E. L. Nusz, L. B. Rhodes, B. C. Wilkerson, George W. Bender, E. H. Smith, A. J. Crowley and A. F. Stuebing. Spaces 554 and 555.

Bradley Washfountain Company, Milwaukee, Wis.—Washroom fixture known as Washfountain. Represented by Walter H. Silpath. Space 663.

Brewster, Inc., Morris B., Chicago.—Metallic packing for locomotive piston rod and valve stem; air pump packing. Represented by John Ash, Roy O. Arringdale and Morris B. Brewster. Space 612.

Bridgeport Safety Emery Wheel Co., Inc., The, Bridgeport, Conn.—86-in. sectional wheel guide bar grinder; sectional wheel chuck and blocks; No. 7 alternating current motor driven floor grinder. Represented by Daniel T. Homan, Henry H. Peck and I. L. Burritt. Spaces 8 and 9, Arkansas Avenue Annex.

Brill Company, The J. G., Philadelphia, Pa.—Model of No. 55 gasoline car; photographs of various types of gasoline cars; operating cost data. Represented by C. J. McPherson, C. Guernsey, A. F. McCormick and A. H. Hudson. Space 206.

Brubaker & Bros. Company, W. L., Millersburg, Pa.—Taps; reamers. Represented by J. A. W. Brubaker, W. Searls Rose and H. B. Morrison. Space 502.

Buckeye Steel Castings Company, The, Columbus, Ohio.—Buckeye yoke attachments and "D" coupler assembled with A. R. A. center sill construction and striking casting; cast steel bolsters and side frames; 120-ton capacity six-wheel truck model. Represented by J. G. Bower, S. P. Bush, E. W. Campion, E. J. Cooledge, M. R. Hansen, G. T. Johnson, J. C. Larsen, G. A. Macpherson, W. W. Matchneer, M. S. Simpson, H. W. Stertzbach, A. H. Thomas and J. C. Whitridge. Spaces 603 and 605.

Bullard Machine Tool Company, The, Bridgeport, Conn.—42-in. and 24-in. vertical turret lathes; power chucking device; motion pictures. Represented by E. P. Blanchard, J. W. Bray, J. M. Welch and Lee G. Daniels. Spaces 1, 2, 3 and 4, Arkansas Avenue Annex.

Buffalo Brake Beam Company, New York.—Brake beams; brake beam adjusting carriers and safety guards; forged steel brake heads; brake shoe safety keys. Represented by S. A. Crone, A. E. Crone, E. C. Farlow, E. Strassburger, E. F. Gladwell, C. R. Busch and A. Gordon Jones. Spaces 548 and 549.

Buffalo Forge Company, Buffalo, N. Y.—Power punches and shears; forges; power drill presses; pressure blowers. Represented by H. W. Wendt, Jr., E. G. Leonard, W. J. McDowell, R. L. Pope, G. Zimmer, A. T. Yates. Spaces 10, 11 and 12, Arkansas Annex.

Burden Iron Company, The, Troy, N. Y.—Staybolt, engine bolt and rivet iron; iron rivets; hollow drilled iron staybolts. Represented by John C. Kuhns. Space 358.

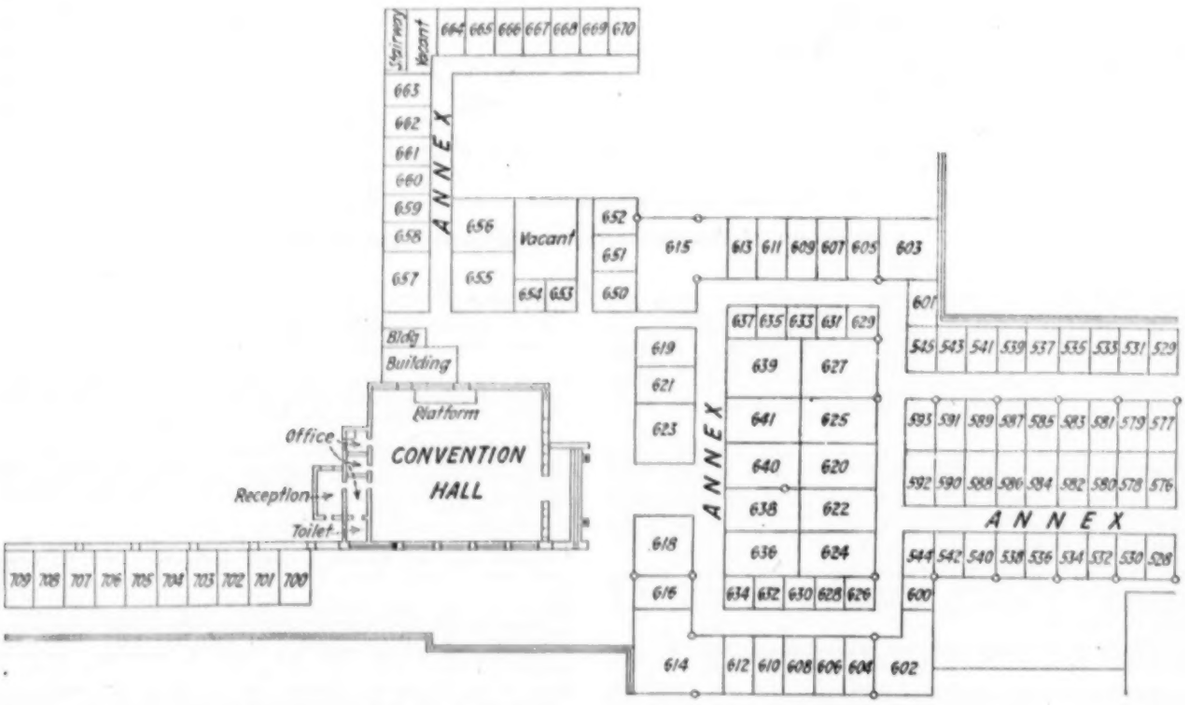
Burr Company, The, Champaign, Ill.—Dynamometer car. Represented by A. E. Huckins. Space on exhibit track.

Burry Railway Supply Company, Chicago.—Reception booth. Represented by O. E. Quinton. Space 526.

Camden Forge Company, Camden, N. J.—Wrought iron equalizing beams; Baldpicon machine; photographs of iron and steel forgings. Represented by W. S. Cox, J. H. Higgins and Regina Flood. Space 658.

Camel Company, Chicago.—Top and bottom supported door fixtures for box and automobile cars; Camel steel doors. Represented by H. E. Creer, W. W. Darrow, A. G. Dohm, H. H. Henricks, C. F. McCuen and A. B. Wegener. Spaces 532, 534 and 536.

Cantilever Wrench Company, Paterson, N. J.—Various sizes of Cantilever reversible chain pipe wrenches. Represented by Simeon T. Toby, Frank J. Carnelli, E. T. Toogood and Gordon N. Perry. Space 660.



Arrangement of Exhibit Spaces at Convention Hall End of Pier

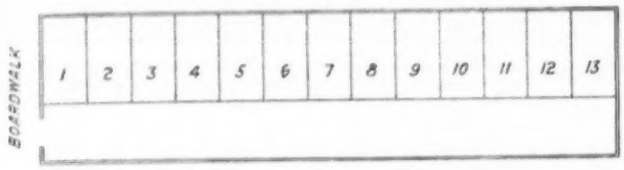
Brown-Lipe Gear Company, Syracuse, N. Y.—Transmissions, clutches and controls for use in gasoline cars, railway coaches, motor busses and trucks. Represented by A. E. Parsons J. O. Pierce, E. S. Nottingham and K. F. Herrick. Space 326.

Carbic Manufacturing Company, Duluth, Minn.—Portable flare lights, portable oxy-acetylene welding and cutting generators and equipment. Represented by Gordon Paterson and M. B. Crouse. Space 700.

Carbo-Oxygen Company, Pittsburgh, Pa.—Cutting and welding apparatus; Carbo-hydrogen gas; Carbo-oxygen gas; pure hydrogen. Represented by F. A. Wirth, V. F. Schrubb and S. R. Read. Space D. (Porch).

Car Fastener Company, Cambridge, Mass.—"Dot" high pressure lubricating system for locomotives; "Dot" line of fasteners. Represented by Warren C. Anderson, Paul K. Niven and Charles L. Hall. Space 661.

Carnegie Steel Company, Pittsburgh, Pa.—33-in. rolled to finish freight car wheel; 36-in. passenger car wheel; 12-in. center sill section. (rolled especially to meet the design recommended by the A. R. A. for car construction); portion of a fabricated center sill using the A. R. A. 12-in. center sill sections; 7-in. car building channel (new section); display of various structural steel sections and pictures outlining manufacture of wrought steel wheels. Represented by W. G. Clyde, John E. Woods, J. C. Shields, C. C. Cluff, L. C. Bihler, G. R. Schreiner, C. Orchard, R. W. Steigerwalt, J. A. Ralston, F. J. Black, R. L. Twitchell and J. F. Miller. Space 420.



Arrangement of Exhibit Spaces in Arkansas Avenue Annex

Caveroil Company of America, Kansas City, Mo.—Method of lubricating combustion chambers of gas engines. Represented by J. N. Joerger and George Porter. Space 700.

Celluloid Zapon Company, New York.—See Zapon Leather Cloth Company.

Celotex Company, Chicago.—Refrigerator car insulation. Represented by J. H. Bracken. Space 669.

Central Electric Company, Chicago.—Industrial receptacles and plugs for electrical connections; locomotive headlight accessory equipment; automatic train control accessory equipment; car lighting fixtures and fans; Gibbs connectors; industrial and office lighting fixtures; Okonite wires and cables; Okonite and Manson tapes. Represented by A. L. McNeill, R. N. Baker and E. H. McNeill. Space 530.

Chambersburg Engineering Company, Chambersburg, Pa.—100-ton hydraulic forcing and bending press; working model of mounting and demounting wheel press. Represented by W. H. Derbyshire, Jr., E. C. Clarke, H. M. Frederick, E. B. Huber, G. R. Murray. Space 84.

Chaton Fibre Company, Boston, Mass.—Chaton all-fibre freight and passenger dust guards. Represented by A. C. Sewall and S. W. Midgley. Space, part of 38, 40 and 42.

Chicago-Cleveland Car Roofing Company, Chicago.—Car roofs; carlines; uncoupling device; Reliable hand brake booster. Represented by R. C. Dudley, Charles D. Jenks, J. L. Stark, T. H. Williams, R. C. Munro, E. H. Mattingley and H. E. Anderson. Spaces 590 and 591.

Chicago Nipple Manufacturing Company, Chicago.—Blue Ribbon pipe nipples; pipe coils and bends. Represented by Bedingfield Mallory. Space, part of B.

Chicago Pneumatic Tool Company, New York.—Boyer riveting and chipping hammers; Little Giant air drills, including new 36 Red Giant; Little Giant electric tools; air hoist; staybolt riveters; rivet busters and cutters; air compressors. Represented by H. A. Jackson, A. E. Goodhue, W. H. Callan, A. C. Andresen, H. G. Barbee, J. L. Rowe, N. B. Gatch, A. M. Brown, W. C. Straub, A. H. Collins, T. P. Kimman, F. H. Blanding, D. E. Cook and E. K. Lynch. Space 623.

Chicago Railway Equipment Company, Chicago.—Brake beams; brake beam supports; side bearings; moving picture showing manufacture and use of brake beams and brake beam supports. Represented by E. B. Leigh, A. C. Moore, F. T. DeLong, G. N. Van Sweringen, E. G. Busse, E. E. Griest, R. J. Sheridan, E. A. LeBeau, F. R. Carlson and H. M. Van Sweringen. Space 640.

Chicago Varnish Company, Philadelphia, Pa.—Varnishes. Space, part of 360.

Chisholm-Moore Manufacturing Company, Cleveland, Ohio.—Cyclone high speed chain hoists, ¼ to 40 tons capacity; Matchless adjustable I-beam trolleys; electric hoists; Little Giant air hoist. Represented by E. S. Ludlow and G. L. Hunt. Space 140.

Clark Car Company, Pittsburg, Pa.—Type G-6 extension side dump car, air operated. Represented by H. E. Chilcoat, B. K. Mould and W. R. Kennedy. Space 621 and on exhibit track.

Clark Tructractor Company, Buchanan, Mich.—Gasoline propelled lift trucks and tractors; high speed drills and reamers. Represented by M. L. Hanlin, W. M. Oplinger, C. O. Montague, J. P. Ware and W. E. McCabe. Space 137.

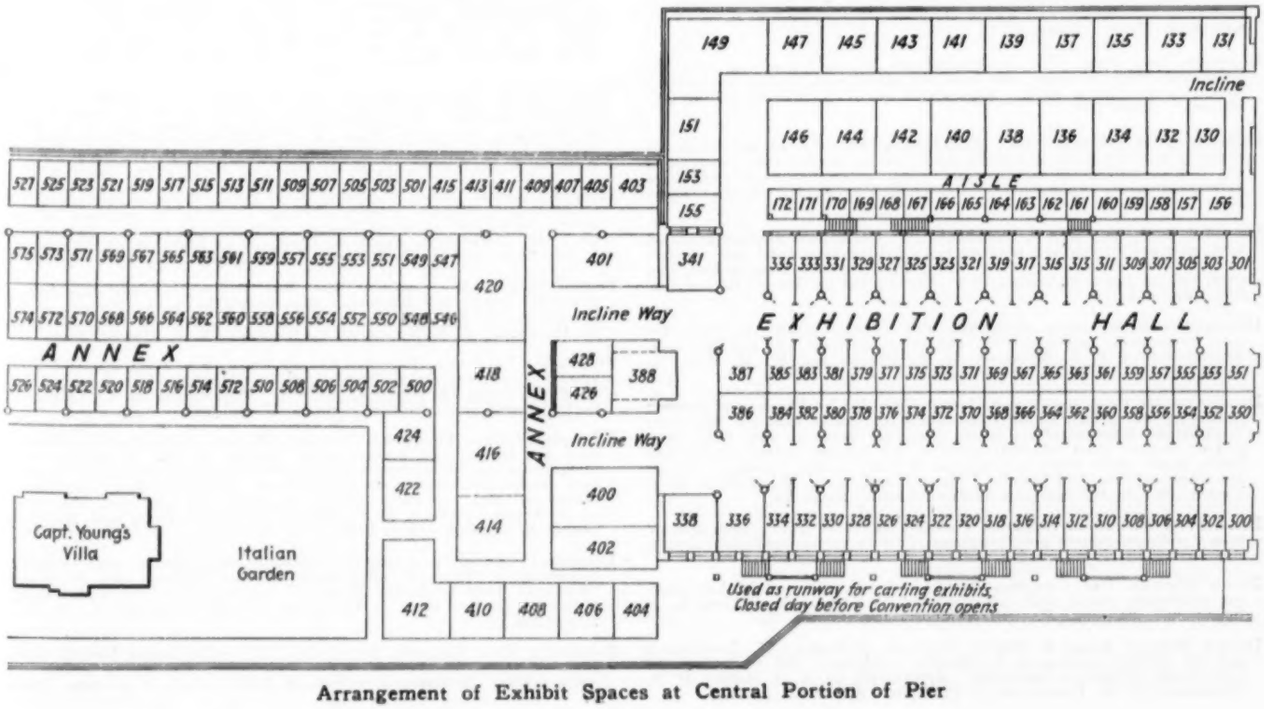
Cleveland Pneumatic Tool Company, The, Cleveland, Ohio.—Riveting hammers; chipping, caulking and beading hammers; ball bearing air drills; rock drills; sand rammers; portable emery grinders; corner drills; reaming, tapping and flue rolling motors; Bowes air hose couplings; Cleco pressure-seated air valves. Represented by H. S. Covey, Arthur Scott, C. J. Albert, R. E. Manning, F. E. Schwarze, R. H. Rockefeller and J. A. Dockery. Spaces 329, 331, 333 and 335.

Cleveland Twist Drill Company, The, Cleveland, Ohio.—Cle-Forge high speed drills; Mezzo super carbon drills; peerless high speed reamers. Represented by W. E. Caldwell, H. G. Smith, R. G. Berrington, J. G. Ladrick and J. B. Dillard. Space 51.

Columbia Machine Tool Company, The, Hamilton, Ohio.—Columbia 32-in. superior heavy duty back geared crank shaper, motor driven, with special equipment for railroad shop work. Represented by E. S. Rich. Space 78.

Commonwealth Steel Company, St. Louis, Mo.—Models of cast steel Delta trailer truck, four-wheel engine truck, pilot and pilot beam, tender frames mounted on four-wheel and six-wheel cast steel trucks; and cast steel engine bed assembled with pilot, pilot beam, engine trucks, cradle, trailer truck and ash pan. Models of cast steel platform and end frames for passenger cars; six-wheel trucks of the bottom equalizer and straight equalizer types. Represented by George E. Howard, Boone V. H. Johnson, C. S. Shallenberger, George H. Gibson, C. P. Whitehead, E. G. Hallquist, H. R. Bartell, W. M. Sheehan and P. R. Kellar. Spaces 386 and 387.

Cone Automatic Machine Company, Inc., Windsor, Vt.—1¼-in. Cone automatic. Represented by F. L. Cone and V. A. Slater. Space 86.



Arrangement of Exhibit Spaces at Central Portion of Pier

Consolidated Machine Tool Corporation of America, Wilmington, Del.—Betts car wheel borer; Newton radius link grinder; Newton crank planer; Modern self-opening die heads and taps, Magic chucks, etc.; photographs of Colburn heavy duty drills and boring mills; photographs of Hilles & Jones punches, shears, rolls and flanging clamps; also punches, dies and couplings. Represented by Wilbur C. Jones, Henry J. Bailey, A. H. Ingle, Alfred Trosch, N. P. Lloyd, Harry W. Champion, D. E. Breckenridge, C. E. McArthur and F. Dana Payne. Spaces 93, 95, 97, 99, 101 and 103.

Covington Machine Company, Inc., Covington, Va.—Hose dismantling and assembling machine; miniature punch. Represented by E. H. Archer and Edgar H. Archer. Space 330.

Crane Company, Chicago.—Cab valves; air brake fittings; railroad unions and fittings; locomotive blow-off valves; pop safety valves. Represented by J. B. Jordan, F. W. Venton and J. C. Cole. Spaces 504 and 506.

Crosby Steam Gage & Valve Company, Boston, Mass.—Locomotive gages; high efficiency locomotive safety valves; spring-seat globe valves; Full-way locomotive blow-off valves; pressure gage testing apparatus; recording gage for hydraulic pressure; chime whistle with electrically operated valve. Represented by Enos L. Taylor and C. E. Shepard. Space 632.

Curtain Supply Company, The, Elkhart, Ind.—Rex sectional diaphragm; Rex vestibule outfit; Rex steel roller with sliding pawl; Rex improved release handle; Rex brass sash and weatherstrip; ring fixtures; Rex roller; Rex deck sash ratchets. Represented by T. P. O'Brien, Ralph Brown, E. E. Whitmore, T. W. Heaton, G. B. Allison and T. W. Holt. Space 638.

Dalman, J. W., Chicago.—Chiles increased spring capacity truck under 50-ton C. M. & St. P. car. Represented by J. W. Dalman. Space 38 and on exhibit track.

Davis Brake Beam Company, Johnston, Pa.—Four-point brake beam support and safety arms; solid truss brake beams; "Dara" rod and channel brake beams; pressed steel journal box lids. Represented by W. E. Fowler, Jr., Charles F. Perkins, George W. Fox and Charles K. Stillwagon. Space 621.

Davis Boring Tool Company, St. Louis, Mo.—Expansion boring tools and reamers, including micrometer expansion boring tools, car wheel boring tools, expansion driving box boring tools, micrometer expansion reamers, adjustable reamers, block type reamers and cutter grinding attachments. Represented by J. M. Davie and G. Harry Baumer. Space 224.

Dearborn Chemical Company, Chicago.—Water treating chemicals; No-ox-id rust preventive. Represented by Robert F. Carr, George R. Carr, J. D. Purcell, G. W. Spear, A. W. Crouch, W. H. Kinney and L. P. Bowen. Spaces 6 and 8.

Delaware & Hudson Company, The, Albany, N. Y.—Locomotive 1050, equipped with M & L tender truck booster. Represented by J. A. McGrew, James Desmond, H. G. Becker, H. A. Flynn and G. S. Edmonds. Space on exhibit track.

Detroit Lubricator Company, Detroit, Mich.—Locomotive automatic exhaust nozzle covers; Bulls-eye locomotive lubricators; automatic flange oilers, air cylinder and air pump lubricators. Represented by H. I. Lord, S. A. Witt, A. G. Machesney, E. T. Wade and C. L. Butler. Spaces 205 and 207.

Diamond Machine Company, Providence, R. I.—30-in. by 84-in. heavy duty face and guide bar grinding machine; 18-in. motor driven floor grinding machine with safety code wheel guards. Represented by Alan A. Wood, Luther H. Burrill and Morris Slepkow. Spaces 113, 115 and 117.

Diamond Power Specialty Corporation, Detroit, Mich.—Diamond "Valve-in-Head" soot blower; Diamond Independent valve soot blowers; Diamond protecting barriers for soot blower elements. Represented by I. S. Forde and M. J. Miller. Space 368.

Dickinson, Inc., Paul, Chicago.—Roundhouse smoke jacks; cast iron caboose and camp car jacks; cast iron and sheet metal Aeolus ventilators; All-cast iron exhaust head. Represented by A. J. Filkins and C. W. Hansen. Space 201.

Dielmore Sales Company, Inc., Philadelphia, Pa.—George automatic locomotive cylinder drain and relief valve; remote control valve; engineer's cab control valve; automatic grease plug; automatic drain and relief valves; automatic drain valves. Represented by R. H. George. Space 225.

Disston & Sons, Inc., Henry, Philadelphia, Pa.—Cold saw machine equipped with sectional interlocking inserted tooth milling saw; band saw machine equipued with metal cutting band saws; display panels showing files, tool steel, milling saws, hack saws, etc. Represented by Joseph L. Dorrington. Space 141.

Distance-Speed Recording Company, New York.—Speed recorders for road locomotives, switch engines, electric locomotives and business cars. Represented by J. E. Matthews, G. B. Dobyns and W. H. Holl, Jr. Space 162.

Dixon Crucible Company, Joseph, Jersey City, N. J.—Dixon cup greases; Silica-graphite paint; triple valve graphite; brake cylinder lubricant; Ticonderoga flake graphite; boiler graphite; graphite pipe joint compound; engine front finishes; greases; for curves, center plates, hub liners, gears, ferry racks and signals; foundry facings; furnace linings; crucibles; crayons and pencils. Represented by J. M. Willitts, J. J. Tucker, W. A. Housten and William Ernst. Space 24.

Dixon Valve & Coupling Company, Philadelphia, Pa.—"Boss" steam and air hose couplings; suction hose couplings; throttle valves; malleable clamps. Represented by H. W. Goodall and J. E. Jones. Space 306.

Dreses Machine Tool Company, The, Cincinnati, Ohio.—6-ft. ball bearing multi-duty radial drill. Represented by Charles E. Gilbert, E. J. Spaeth and Manning, Maxwell & Moore, Inc. Space 80.

Dressel Railway Lamp & Signal Company, Arlington, N. J.—Electric and oil lighting equipment for switch, semaphore and train use; oil and electric locomotive headlights. Represented by A. D. Hobbie, H. S. Hoskinson, F. W. Dressel and J. C. Wylie. Spaces 631 and 633.

Duff Manufacturing Company, The, Pittsburgh, Pa.—Inverted high speed jacks; positive stop journal box jacks; new track and automatic lowering jacks; drop forgings; new type car jacks and coupler jacks. Represented by T. A. McGinley, E. A. Johnson, C. A. Methfessel, C. N. Thulin, E. M. Webb, W. G. Robb, G. E. Watts and G. E. Anderson. Space 401.

DuPont de Nemours & Co., Inc., E. I., Philadelphia, Pa.—Reception booth. Represented by C. A. Lynn. Space 360.

Eagle Manufacturing Company, Wellsburg, W. Va.—Welded steel oilers; torches; tallow pots; supply cans. Represented by S. O. Paull and J. B. Webb. Space 378.

Ebinger Sanitary Manufacturing Company, The D. A., Columbus, Ohio.—Drinking fountain; wash sink; steel toilet enclosures; range closets for factory use. Represented by W. W. Frothingham and H. Harder. Space 659.

Eclipse Interchangeable Counterbore Company, Detroit, Mich.—Interchangeable counterbores; multi-diameter tools; boring tools; adjustable point centers and Welch plug tools; Bath high speed ground taps; Interbal micrometers and thread micrometers. Represented by Frank E. Harrison, J. Hugh Smith, R. G. Michell, John Bath and Chester Bath. Space 668.

Edgewater Steel Company, Pittsburgh, Pa.—Rolled steel wheels; locomotive tires. Represented by Charles H. Sherburne, L. O. Cameron, Joseph H. Perry, Jr., J. H. Baily and Wm. V. D. Wright. Space 509.

Edison Storage Battery Company, Orange, N. J.—Storage batteries for railway car lighting. Represented by D. C. Wilson, D. B. Mugan, H. H. Kennedy, W. F. Baver and W. M. Ingles. Space 636.

Edna Brass Manufacturing Company, The, Cincinnati, Ohio.—Locomotive hydrostatic lubricator; injectors; locomotive fire extinguisher; compound valve; gauge cocks; alarm valve; oil cup; line check valves; auxiliary oiler; boiler checks; type 1922 locomotive coal sprinkler; four-feed mechanical lubricator and operating device; washout plugs. Represented by B. I. Kaufmann, D. B. Joseph, R. B. Buram, E. O. Corey, C. B. Randall, William Beck, R. D. Oatman, H. A. Glenn, F. S. Wilcoxen and J. E. Dillon. Space 308.

Edson Manufacturing Corporation, Boston, Mass.—"On Top" air cooled gasoline engine diaphragm pump power unit; Style A diaphragm hand pump; No. 0 Light galvanized diaphragm force pump; special suction hose and pump accessories. Represented by L. O. Arringdale. Spaces 566 and 567.

Edwards Company, Inc., The O. M., Syracuse, N. Y.—Window fixtures; sash balances; sash locks; top, bottom and side weatherstripping; steel vestibule trap doors; brass sash. Represented by O. M. Edwards, Harold Edwards, J. J. Edwards, E. F. Chaffee, C. H. Rockwell and A. J. Horgan. Spaces 527 and 529.

Electric Arc Cutting & Welding Company, Newark, N. J.—Alternarc welding machines; Alternarc cutting and welding machines; Alternarc rivet cutter; Newarc Electrodes; helmets, shields, welding handles, glasses and other electric welding accessories. Represented by C. J. Holslag, J. E. Coffin, J. E. Gunning and H. N. Ewertz. Space 37.

Electric Controller & Manufacturing Company, The, Cleveland, Ohio.—Type NC motor; 40-deg. squirrel cage induction motors; type ZK manual-automatic starting compensator for squirrel cage motors; push button operated oil immersed automatic starting compensator for squirrel cage motors; push button operated across-the-line starting switch having temperature overload relays for squirrel cage motors; alternating current magnetic contactors; d. c. push button operated autmatic motor starters. Represented by H. K. Hardcastle, G. W. C. Frey, W. R. Yorkey, J. C. Snyder and R. G. Widdows. Space 85.

Electric Service Supplies Company, Philadelphia, Pa.—Golden Glow locomotive headlights; Keystone turbo-generators; headlight switches; Golden Glow floodlight projectors; locomotive gage lights; roundhouse lighting units. Represented by Charles J. Mayer, A. H. Englund, J. R. McFarlin, L. A. Darling, T. M. Childs, H. M. Graham, J. B. Miller, W. H. Smaw and S. H. Dannatt. Spaces 574 and 575.

Electric Storage Battery Company, The, Philadelphia, Pa.—Three-k. w. body hung axle generator and Exide battery; Ironclad Exide car lighting unit; Gummite container. Represented by William H. Palmer, Jr., H. S. Mills, W. H. Payne, Thomas L. Mount, R. W. Whitehurst, F. S. C. Folk, F. G. Beetem, L. E. Lighton, R. I. Baird, H. E. Hunt, H. W. Beedle, E. H. Watkins, J. D. Fischer, W. H. Hooven and M. C. Pope. Space 624.

Elvin Mechanical Stoker Company, New York.—Elvin mechanical stoker in operation; separate exhibit showing the internal workings of the stoker engine and principal internal parts of the stoker. Represented by E. W. Englebright, Frank H. Clark, A. G. Elvin, A. B. Fahnestock, F. H. Elvin and H. D. Eckerson. Space 146.

Elwell-Parker Electric Company, The, New York.—Electric storage battery industrial trucks and tractors. Represented by L. C. Brown, G. W. Brown, W. C. Kershaw, L. R. Millar, C. B. Cook, C. E. Cochran, D. N. Hanchette, F. B. Neeley, C. C. Dietz and R. C. Howell. Space 341.

Emery, E., Pittsburgh, Pa.—Self-locking brake shoe keys; standard taper pins and machine keys; Mead-Morrison "Handi" rivet forge; Mead-Morrison non-pressure heating torches. Represented by E. Emery, P. C. Cady and J. A. Mueller. Space 21 and 701.

Enterprise Railway Equipment Company, Chicago.—Door operating mechanisms for hopper and gondola cars; models of load discharging cars; illustrations of 5½-in. by 10-in. and 6-in. by 11-in. axle load capacity cars, including hopper, gondola, general service, ballast, combination ballast and coal, convertible ballast, ore, stock and tank cars. Represented by Argyle Campbell, A. E. Zimmer, George B. Dorey and Walter L. Gunnison. Spaces 584 and 585.

Equipment Specialties Company, Chicago.—Refrigerator car specialties consisting of "Equipco" pilfer-proof all-metal bulkhead and ice grates; "Equipco" bevel hatchway; "Equipco" pressed steel drain trap. Represented by L. L. Cohen, J. H. Kuhns, W. R. Gillies and G. A. Hull. Space 202.

Everlasting Valve Company, Jersey City, N. J.—Everlasting blow-off valve; Flatplug valve; Everlasting tender tank valve; Everlasting bottom discharge valve. Represented by John H. Allen and E. N. Corning. Space 17.

Ewald Iron Company, Louisville, Ky.—Solid and hollow staybolt iron. Represented by S. F. Sullivan, J. P. Boorke, R. F. Kilpatrick and G. O. Boomer. Space 537.

Flannery Bolt Company, Pittsburgh, Pa.—Tate flexible staybolts and installation tools for applying; F. B. C. welded flexible staybolts; grease cups; rigid, crown and buttonhead staybolts; electrical staybolt testers; boiler sections with installations of F. B. C. hollow drilled flexible staybolts. Represented by J. Rogers Flannery, George E. Howard, G. G. Greenslade, James A. Murrian, E. S. Fitzsimmons, E. G. Flannery, W. S. Murrian, W. M. Wilson, F. K. Landgra fand John H. Murrian. Spaces 592 and 593.

Ford Company, J. B., Wyandotte, Mich.—Wyandotte metal cleaner; Wyandotte industrial alkali. Represented by W. E. Ratz, W. P. Scott, G. E. Gordon, B. N. Goodell and Chief Little Bear. Space 519.

Fort Pitt Malleable Iron Company, Pittsburgh, Pa.—Improved arch bar truck; various malleable iron castings and specimens. Represented by Frank J. Lanahan, J. S. Lanahan, E. H. Holmes and Joseph H. Kummer. Space 621.

Foster Company, Walter H., New York.—Semi-automatic machine with adjustable cutter head for turning on centers frame and rod bolts; either straight or taper semi-automatic machine for centering, pointing and facing frame and rod bolts; semi-automatic valve finishing machine for repairs on air brake equipment valves. Represented by Walter H. Foster, J. A. Eden, Jr. and H. L. Kenah. Spaces 87 and 89.

Foster Machine Company, Elkhart, Ind.—2-B Universal turret lathe, motor driven, with bar and chucking equipment. Represented by H. E. Witham and O. B. Clemens. Space 82.

Franklin Railway Supply Company, Inc., New York.—Locomotive Booster with control mounted on trailer truck; locmootive Booster with tender truck;Precision reverse gear; Ragonnet type "E" reverse gear; Franklin driving box; lateral motion driving box; adjustable driving box wedge; No. 8 Butterfly firedoor; Radial buffer; Unit safety bar; McLaughlin flexible joint; driving box lubricator. Represented by J. S. Coffin, S. G. Allen, H. F. Ball, W. H. Coyle, J. L. Randolph, H. M. Evans, C. W. F. Coffin, M. H. Roberts, W. T. Lane, J. L. Bacon, F. R. Peters, F. M. Ball, J. McLaughlin, T. L. Reed, S. D. Rosenfelt, P. Weiler, P. Willis, J. A. Talty and T. P. Whelan. Spaces 402, 414, 416, 422 and 424.

French Battery & Carbon Company, Madison, Wis.—Dry cell batteries; signal lantern batteries; flashlight batteries; radio batteries. Represented by W. S. Marvin, C. D. Boyd and L. R. Schadwald. Space 35.

Frost Railway Supply Company, The, Detroit, Mich.—Harvey friction draft springs; Frost friction bolster cushion. Represented by Harry W. Frost and George A. Cooper. Space 562.

Galena-Signal Oil Company, Franklin, Pa.—Reception booth. Represented by L. J. Drake, L. F. Jordan, W. A. Trubee, J. E. Linahen, W. P. Westcott, G. L. Morton, W. J. Walsh, P. G. O'Hara, T. J. Powell, Daniel Rice, P. H. Stack, C. G. Melvin, R. R. Vinnedge, D. L. Eubank, W. O. Taylor, W. F. Walsh, J. S. Brown, G. W. Bucknitt, I. T. Burney, W. H. Foster, A. J. Howley, N. E. Snrowl, W. E. Ladley, W. J. McGee, C. McNair, R. J. McQuade, F. B. Smith, E. G. McVicar, E. H. Baker, S. S. Shields, J. C. O'Connor and B. H. Morris. Space 32.

Gallmeyer & Livingston Company, Grand Rapids, Mich.—Grand Rapids Universal cutter and tool grinder, motor driven; Grand Rapids drill grinders; Grand Rapids tap grinder; Union portable motor driven wood working machinery; Valley City grinder. Represented by S. Owen Livingston and J. De Koning. Space 314.

Garlock Packing Company, The, Palmyra, N. Y.—Metal packing service for locomotive air pumps; various asbestos, rubber and fibrous packings for railroad purposes. Represented by H. W. Gulager, G. L. Abbott, L. P. Duggan, R. L. Hinkle, M. P. Junkin, H. J. Ramshaw, C. E. Roscoe, C. W. Sullivan and H. N. Winner. Space 578.

Gem Manufacturing Company, Pittsburgh, Pa.—Welded steel railroad oilers, torches and oil carriers. Represented by James A. Fownes and George H. Speer. Space 653.

General Electric Company, Schenectady, N. Y.—Automatic arc welder; WD-12 welding generator; a.c. motors; headlight turbine set; steam, water and air electric flow meter; electric furnace; Fabroil and Textolite gears; automatic and hand control apparatus; thermal cut-outs; insulated wire; locomotive floodlight; C. M. & St. P. electric locomotive. Represented by C. C. Bailey, J. W. Belanger, J. A. Boers, W. M. B. Brady, G. B. Cose, D. H. Devoe, C. Dorticos, W. J. Dorworth, M. C. Fitzgerald, D. K. Frost, W. A. Gluesing, I. W. Harper, F. S. Hartman, W. J. Hedley, J. M. Hollister, M. M. Hughes, F. P. Jones, J. P. Jones, C. B. Keyes, C. F. Lawrence, J. J. Liles, C. K. Mead, F. H. Penney, C. C. Pierce, C. F. Pittman, R. D. Read, John Roberts, C. C. Runner, R. M. Shook, L. W. Shugg, W. H. Sigourney, E. B. Smith, B. C. Tracey, H. C. Uhl and E. P. Waller. Spaces 119, 121, 123, 125, 127, 129 and on exhibit track.

Giessel Company, Henry, Chicago.—Sanitary drinking water coolers and water filters for railway equipment. Represented by Arthur W. Barth, V. A. Dickinson, Frank N. Crigg, Ross F. Hayes and Stanley W. Midgley. Spaces 38 and 42.

Gilbert & Sons Brass Foundry Company, A., St. Louis, Mo.—Finished brass metals; bearing metals; castings. Represented by William H. Ivers. Space 230.

Gill Railway Supply Company, Peoria, Ill.—"Grisco" cooling compound; driving box with adjustable quarter brasses; emergency hose clamp; cutting lubricant; boiler preservative. Represented by D. H. French, E. H. Hartenstein and H. C. Gillette. Space 325.

Globe Railway Equipment Company, St. Louis, Mo.—Trackless car door hanger. Represented by W. L. Celton, E. E. Peake and C. E. Slayton. Space H, front porch.

Globe Steel Tubes Company, Milwaukee, Wis.—Samples of locomotive boiler tubes, safe ends and arch tubes (seamless steel). Represented by F. J. O'Brien, John W. Floto and R. R. Lally. Space 204.

Goddard & Goddard Company, Detroit, Mich.—High power production railroad and standard milling cutters and reamers. Represented by C. H. Wallace, Joseph Sample and Dix Procter. Spaces 158 and 159.

Gold Car Heating & Lighting Company, New York.—Vapors, steam and electric systems of car heating; ventilators and automatic temperature regulation for all types of car heating systems and for buildings. Represented by E. E. Gold, E. B. Wilson, A. B. Strange, F. W. Dearborn, F. O. Bailey, J. O. Brumbaugh, F. H. Smith, W. G. Willcoxson, A. D. Stuver, W. J. Roehl, C. W. Stevens and F. W. Moore. Spaces 350, 351, 352 and 353.

Goodall Rubber Company, Philadelphia, Pa.—Rubber and semi-metallic hose; piston and sheet packings. Represented by A. W. Swartz and George B. Wood. Space 306.

Goodrich Rubber Company, B. F., Akron, Ohio.—Reception booth. Represented by C. E. Cook, E. A. Bedell, B. T. Moffatt and Frank Flavell. Space 10.

Gould & Eberhardt, Newark, N. J.—32-in. Invincible shaper with direct connected motor drive. Represented by J. J. Duffy, F. G. Eberhardt, H. E. Eberhardt, C. L. Cameron and W. F. Zimmermann. Space 111.

Gould Coupler Company, New York.—Freight and passenger car couplers; journal boxes; friction draft gears; friction buffers; truck side frames; locomotive end sill; slack adjusters; car door fasteners; electric car lighting; locomotive headlight equipment; storage batteries. Represented by Charles A. Gould, W. F. Richards, W. F. Bouche, D. C. Davis, M. R. Shedd, G. R. Berger, P. H. Simpson, H. C. Johnstone, William Garstang, W. H. Sauvage, A. N. Slocum, M. M. Llera, W. F. Martens, H. E. Sicardi, F. J. Beard and W. B. Osborne. Space 221.

Gray Company, G. A., Cincinnati, Ohio.—Maximum service planer, 36-in. by 36-in. by 10-ft., reversing motor drive. Represented by August Marx, Tell Berna and Philip Leisinger. Spaces 69, 71 and 73.

Griffin Wheel Company, Chicago.—Chilled iron car wheels. Represented by George D. Casgrain, A. A. Hale, F. B. Flinn, George Acker and C. P. Whitcomb. Space 620.

Grip Nut Company, Chicago.—Grip nuts, grip holding nuts and grip unit nuts for locomotives, cars and track. Represented by W. E. Sharp, A. C. Woods, Robert Fleming, H. E. Passmore, J. B. Whitenack and Albert Roberts. Space 144.

Hale-Kilburn Company, Philadelphia, Pa.—Complete line of car seats for main line systems and suburban service. Represented by H. L. Beyer, W. M. Swope, A. F. Old, H. B. Gengenbach, T. C. Coleman, Blake C. Howard, Wm. D. Jenkins, W. L. Jefferies, Jr., W. J. Clair, R. F. Stubblebine, R. O. Young, L. Weisenburger, P. J. Tucker and E. A. Thornwell. Spaces 408 and 410.

Hall Draft Gear Corporation, Watervliet, N. Y.—Friction draft gears and parts, including a new design. Represented by T. D. Potts, C. W. Sherman, J. M. Hall, D. Armstrong and L. O. Cameron. Space 372.

Hanna Engineering Works, Chicago.—Models of pneumatic compression yoke riveters and straight lift air hoists. Represented by A. F. Jensen, John C. Hanna, J. B. Corby, W. F. Delaney and H. I. Kann. Space, part of 153 and 155.

Hanna Stoker Company, The, Cincinnati, Ohio.—Locomotive stoker. Represented by W. T. Hanna, C. D. King, J. T. Cahill and G. D. Peverall. Space 139.

Hauck Manufacturing Company, Brooklyn, N. Y.—Venturi oil burners, high and low pressure types; Venturi suction type rivet heating forges; Venturi portable suction torches; Venturi low pressure heating furnace; locomotive tire heater, suction type; locomotive fire kindlers and boiler testers. Represented by Walter C. Elze, George N. Broadhurst, A. F. Schumann, J. Rock Armstrong and F. John Schwenk. Space 706.

Heisler Locomotive Works, Erie, Pa.—Aluminum working model of a Heisler geared locomotive. Represented by G. L. Swabb and F. L. Swabb. Space 910.

Heywood-Wakefield Company, Wakefield, Mass.—Coach and parlor car chairs in plush; electric car seat in rattan; bus chairs and seats in reed, genuine and imitation leather; nickel plated mechanism, rattan webbing. Represented by Bertram Berry, George E. Cornwall, Frank W. Grigg, Edward Bucker and W. E. Foreman. Space 520.

Hoopes & Townsend Company, Philadelphia, Pa.—Nuts; bolts; rivets; screw spikes, etc. Represented by H. L. Harrison. Spaces 370 and 371.

Houghton & Co., E. F., Philadelphia, Pa.—Carburizers; heat treating materials; cutting oils; quenching and tempering oils; rust preventives; leather belting and packings; oils and leathers for the railroads. Represented by J. E. Burns, J. Coleman Bentley and Charles F. Pierce. Space 374.

Hunt, G. L., Philadelphia, Pa.—Lathe, planer, drill and milling machine chucks; chain blocks; overhead trolleys; electric and air hoists; hack saws and metal band saws; wrenches; lathe dogs; "C" clamps; ratchet drills; lathe, boring and cutting-off tools; pipe stocks and dies; pipe vises and cutters; chain pipe wrenches. Represented by G. L. Hunt and Osgood Sayen. Space 140.

Hunt-Spiller Manufacturing Corporation, South Boston, Mass.—Hunt-Spiller gun iron cylinder bushings and packing rings; Dunbar and Duplex cylinder packing rings; piston and piston bull rings; piston valve bushings, packing rings and bull rings; crosshead shoes; shoes and wedges; floating side rod bushing installation; air pump bushings. Represented by W. B. Leach, J. G. Platt, V. W. Ellet, A. B. Root, Jr., E. J. Fuller, C. L. Galloway, F. B. Hartman and R. R. Wells. Spaces 564 and 565.

Huron Manufacturing Company, Huron, Mich.—Locomotive wash-out plugs. Represented by H. N. Reynolds and E. H. Willard. Space, part of 38.

Hutchins Car Roofing Company, Detroit, Mich.—Models and samples of car roofs, car ends and car uncoupling devices. Represented by J. F. Comee, J. T. Martyn, F. C. Dunham, A. R. Wilson and W. D. Thompson. Space 616.

Hyatt Roller Bearing Company, Newark, N. J.—Complete line of Hyatt roller bearings for freight and passenger cars, railway service cars and baggage trucks; Hyatt equipped freight car truck and wash drawings showing approved methods of applying Hyatt roller bearings to railroad cars. Represented by H. A. Brown, Jr., Earl E. Eby, V. N. DeLamater, W. L. Iliff, W. B. Wachtler, C. W. Benica and P. C. Gunion. Space 142.

Illinois Steel Company, Chicago.—Wheels; interior views of steel plant manufacturing material used in car building. Represented by O. H. Baker, C. B. Friday, E. G. Sutcliff, Grant Monk and C. R. Moffatt. Space 420.

Independent Pneumatic Tool Company, Chicago.—Representative types of all Thor pneumatic tools, including pigmy air drills, turbine air drills, piston air drills of several sizes, close corner air drills, portable pneumatic motor hoists, light riveting hammers, long stroke riveting hammers and rivet busters; two new electric tools including a quick interchangeable electric drill and reversible electric tapping machine. Represented by John D. Hurley, Ralph S. Cooper, A. Anderson, W. A. Nugent, H. C. Hulbert, I. T. Cruice, A. L. Schuhl, A. Levedahl, H. F. White, V. W. Robinson, F. J. Passino, W. H. Rosevear, H. G. Keller and R. E. Kelly. Spaces 556 and 557.

Individual Drinking Cup Company, Inc., Easton, Pa.—Dixie penny vending machines; Dixie cups; Dixie cup machines for parlor car use. Represented by A. R. Lillicrapp and M. E. Morrison. Space 34.

Ingersoll Milling Machine Company, The, Rockford, Ill.—Milling cutters; motion pictures of milling machines in operation. Represented by W. H. Foster, H. L. Kenah and A. A. Braid. Space 91.

Ingersoll-Rand Company, New York—Riveting, chipping and scaling hammers; reversible and non-reversible drills; portable grinders; pedestal grinders; wire brush machines; pneumatic motor hoists; tie tampers; core breakers; sand rammers; air compressors. Represented by G. A. Gallinger, W. A. Johnson, L. W. Schnitzer, J. R. Randle, C. C. Lance, J. W. Anderson and G. C. Williams. Space 53.

International Correspondence Schools, Scranton, Pa.—Books; students' work; air brake models; photographs. Represented by E. M. Sawyer, Paul V. Barrett, L. M. Gardner, H. M. McAskie, R. B. Keller and Seth W. Shoemaker. Space 170.

International Motor Company, New York.—Mack rail car power truck. Represented by Edwin M. Post, Jr. Space on exhibit track.

International Signal Company, New York.—Webb Automatic train control. Represented by Jean F. Webb, Jr., and H. Tracy Rogers. Space F (porch).

Irving Iron Works, Long Island City, N. Y.—Safkar step; Safkar freight car walkway; Irving subway types "G" and "E"; Irving Safsteps. Represented by E. E. Brodhead, L. H. DeVoe and William Noblett. Space 667.

Irwin Auger Bit Company, The, Wilmington, Ohio.—Complete line of wood boring tools and boring machines to demonstrate same. Represented by G. M. Riley, W. F. Taylor and C. J. Robinson. Space 304.

Jacques Company, H. W., Philadelphia, Pa.—Leather belting; tin and galvanized ware; switch, general purpose and signal locks; hickory tool handles and brake sticks; wrenches. Represented by H. W. Jacques, C. T. Johnson and C. H. Gibbs. Space 336.

Jefferson Union Company, Lexington, Mass.—Unions and pipe fitting specialities. Represented by Daniel T. Groff. Space 20.

Jenkins Brothers, New York.—General service and locomotive valves; Selclo valve; rapid action valve; valve discs; mechanical rubber goods. Represented by George Royal and Charles B. Yardley. Space 563.

Johns-Manville, Inc., New York.—Asbestos packings; asbestos shingles and roofings; high temperature cements; Transite and ebony wood; asbestos and magnesia pipe covering; magnesia boiler lagging; friction tapes and splicing compounds; passenger and refrigerator car insulation; industrial flooring; waterproofing materials; steam traps; locomotive and power plant specialties. Represented by H. L. Leach, H. Flannagan, J. D. Johnson, F. J. Horne, G. A. Nicol, J. H. Trent, P. C. Jacobs, H. G. Newman, L. Patineau, J. C. Younglove, C. S. Clingman, L. S. Wilbur and W. R. Bush. Spaces 580 and 581.

Jones & Lamson Machine Company, Springfield, Vt.—Hartness flat turret lathe; staybolt threading attachment; Hartness automatic opening dies; Flanders ground taps. Represented by H. S. Beal, G. H. Brigham, John C. Price, F. E. Lockwood and H. F. Holden. Space 132.

Jones & Laughlin Steel Corporation, Pittsburgh, Pa.—Wire products; fencing; reinforcing bars; spikes; tie plates. Represented by R. M. Kilgore, R. D. Jenks, R. T. Rowles and A. A. Wagner. Spaces 409 and 411.

Joyce-Cridland Company, The, Dayton, Ohio.—Lifting jacks. Represented by Arthur S. Beattys, W. I. Clock, Charles D. Derby, R. L. Skidmore and William F. Bippus. Spaces 607 and 609.

K-G Welding & Cutting Company, Inc., New York.—Welding and cutting torches. Represented by William D. Flannery, Philip Kearney and J. W. Evans. Space 705.

Keller Mechanical Engineering Corporation, Brooklyn, N. Y.—BG 482 automatic die sinker in operation, contouring and form cutting, automatic and semi-automatic; R-6 Universal and radial cutter grinder; BK and BK-2 flexible shaft grinders; samples of work done on Keller machines. Represented by Jules Diercks, S. A. Keller, J. C. Shaw, R. D. Shaw, Charles Bitter, Henry Schreiber and A. J. Benson. Spaces 5 and 6, Arkansas Avenue Annex.

Keller, Inc., William H., Grand Haven, Mich.—Riveting and chipping hammers; rammers and drills; rivet busters and grinders; miscellaneous accessories. Represented by Ernest Shaff, William J. Devlin, J. B. Corby, W. F. Delaney, R. C. Fenner and W. H. Loutit. Space 153.

Kerite Insulated Wire & Cable Company, The, New York.—Insulated wires and cables. Represented by B. L. Winchell, Jr., Azel Ames, P. W. Miller, J. W. Young and J. A. Renton. Spaces 523 and 525.

Keyoke Railway Equipment Company, Chicago, Ill.—Murray cast steel friction draft gears and various types of cast steel coupler yokes. Represented by R. J. Cook, W. J. Robider, Joseph A. Cameron and C. J. Holland. Space 309.

King Pneumatic Tool Company, Chicago.—Pneumatic riveting and chipping hammers; Pneumatic rivet cutters; King sleeve valves for riveting hammers; King stem control throttle valves for riveting and chipping hammers; molybdenum steel pistons; locomotive arch tube cleaners. Represented by G. A. Barden, E. N. Hurley, Jr., H. A. Torson and D. B. Parker. Space 534.

Landis Machine Company, Waynesboro, Pa.—1½-in. double head staybolt machine; 4-in. pipe threading and cutting machine; Land-Matic die heads; reverse taper die head for threading staybolts; chaser grinder. Represented by C. N. Kirkpatrick, C. F. Meyer, F. C. Delcher and John J. I. Davis. Spaces 79, 81 and 83.

Lapointe Machine Tool Company, Hudson, Mass.—Broaching machines; broaching tools. Represented by H. H. Metcalf and F. J. Jackson. Space 311.

Latrobe Tool Company, Latrobe, Pa.—High speed drills; high speed bridge, car and locomotive reamers; high speed track bits. Represented by W. L. Klingelhofer, G. A. Moore and C. F. Petty. Space 361.

Lebanon Steel Foundry, Lebanon, Pa.—Electric furnace steel castings. Represented by W. H. Worrilow, A. J. McDonald, T. V. Blodgett and J. D. Brant, Jr. Space I. (Porch).

Lehmann Machine Company, St. Louis, Mo.—22-in. 24½-in. by 11-ft. Lehmann lathe, sixteen speed geared head motor drive. Represented by L. A. Carter, Paul Lehmann and O. W. Johanning. Space 92.

Lehon Company, The, Chicago.—Canvas, plastic and burlap back car roofing; roll, shingles and built-up asphalt building roofing; waterproof insulating fabric; sheathing and waterproof insulating papers; asphalt waterproofing materials; (membranes, burlaps, felts and asphalts) asphalt roof coatings; Master Car Builders' cements. Reprseented by Tom Lehon and Frank Carpenter. Space 16.

Libbey Glass Manufacturing Company, The, Toledo, Ohio.—High pressure gage glasses, reflex glasses; Bulls Eye lubricator glasses; lantern globes, signal lenses. Represented by J. A. Carson. Space 528.

Liberty Manufacturing Company, Pittsburgh, Pa.—Liberty type air, water and steam operated arch tube cleaners; Lagonda type air, water and steam operated arch tube cleaners; Liberty type surface cleaner. Represented by H. A. Pastre. Space 131.

Link-Belt Company, Chicago.—Silent chain; roller chain; electric hoists. Represented by James S. Watson and Horace Bowman. Space 160.

Locomotive Firebox Company, Chicago.—Nicholson thermic syphon. Represented by John L. Nicholson, George R. Carr, A. A. Taylor, Walter S. Carr, L. R. Pyle, John Baker, C. A. Seley and C. M. Rogers. Spaces 382, 383, 384 and 385.

Locomotive Stoker Company, Pittsburgh, Pa.—Duplex locomotive stokers, types D-1 and D-2; mechanical stoker for small size locomotives, type L-1; mechanical stoker for steam shovels or other small boilers, type G-2; mechanical coal pusher for locomotive tenders. Represented by W. S. Bartholomew, J. J. Byrne, O. B. Capps, W. G. Clark, D. F. Crawford, J. J. Hannahan, R. G. Kelley, N. M. Lower, E. Prouty, L. V. Stevens, A. L. Whipple, A. N. Willsie, H. C. Woodbridge, E. F. Milbank, Karl Stoller and L. E. Osborne. Spaces 403, 405 and 407.

Logan Drinking Cup Company Division, U. S. Envelope Company, Worcester, Mass.—Finback, Jr., drinking cups and cabinets; Columbian drinking cups and cabinets. Represented by Donald B. Logan, Francis P. Swallow and Ernest S. Reid. Space 377.

Long, Jr., Company, Charles R., Louisville, Ky.—Railway and industrial paints. Represented by Charles R. Long, Jr., Harry Vissering, G. S. Turner, Samuel W. Russell, J. M. Monroe, W. H. Heckman and J. S. Lemley. Space 579.

Lovell & Co., F. H., Arlington, N. J.—Electric lighting fixtures and wiring appliances for locomotive equipment; Bishops adamant gage glasses; car lighting equipment. Represented by A. D. Hobbie and J. C. Wylie. Spaces 631 and 633.

Lucas Machine Tool Company, Cleveland, Ohio.—No. 32 "Precision" horizontal boring, drilling and milling machine machining Pilliod locomotive valve gear frames; 50-ton power forcing press for forcing locomotive driving box crown brasses, rod bushings, brake lever fulcrum, link hanger and all motion work bushings, etc., in and out. Represented by F. P. Sprague, J. A. Leighton, J. H. Locke and L. Reulbach. Space 13, Arkansas Avenue Annex.

Lukens Steel Company, Coatesville, Pa.—Largest one-piece flanged boiler head in the world—15-ft. 3-in. finished diameter by 1 1-8 in. thick; samples of special tests on steel; pressed steel boiler brace and manhole covers; photographs. Represented by F. H. Gordon, G. T. Shants, G. L. Gordon, Harry Loeb, W. G. Humpton and A. Goodfellow. Spaces 4, A and B.

Lunkenheimer Company, The, Cincinnati, Ohio.—Bronze valves; iron body bronze mounted valves; steel monel mounted valves; boiler mountings; pop and relief valves; whistles; oil and grease cups; lubricators. Represented by W. M. Hood, Howard J. Evans and Andrew Lauterbach. Spaces 531 and 533.

Mac-L-ite Alloy Corporation, Maysville, Ky.—Journal bearing and light alloy products. Represented by S. C. Scott. Space 373.

McCabe Manufacturing Company, Lawrence, Mass.—Working model of flanging machine; flanged flue sheets and car parts. Represented by Fred H. McCabe and Hugh McCabe. Spaces 116 and 118.

McConway & Torley Company, The, Pittsburgh, Pa.—Pitt pivoted passenger coupler with quadruple shear yoke; type D passenger coupler and uncoupling device; type D freight coupler and cast steel yoke; type D pilot coupler and extended floor pocket; Janney-Penn freight couplers. Represented by William McConway, Jr., W. J. Regan, I. H. Milliken and H. F. Dunbar. Spaces 501, 503 and 505.

MacRae's Blue Book Company, Chicago.—MacRae's Blue Book. Represented by Albert MacRae, Daniel N. Peirce, R. S. Lundy, R. A. Holme and F. O. Rice. Space 22.

Madison-Kipp Corporation, Madison, Wis.—Force feed locomotive lubricators. Represented by Joseph A. Coleman, William B. Wheeler, A. H. Flanagan, John Borrowdale and S. W. Midgley. Space 36.

Mahr Manufacturing Company, Minneapolis, Minn.—Mahrvel No. 18 rivet forge; No. 101 safety vacuum torch; No. 1-C torch outht; direct connected low pressure blower; calorizer. Represented by R. G. White, E. F. Piea, W. S. Murrian, C. F. Olmstead and D. W. McConaghy. Space 652.

Manning, Maxwell & Moore, Inc., New York.—Steam specialties manufactured by the United Injector, Hancock Inspirator, Hayden & Derby, Consolidated Safety Valve and Ashcroft Manufacturing Companies; Putman double axle lathe, 54-in. vertical boring and turning mill and pattern tool block for coach and driving wheel lathes; Boye & Emmes 20-in. coneless lathe, geared head type; Snyder 36-in. drill; Sundstrand combined surface and internal grinder; 14-in. Springfield portable engine lathe; National 1½-in. triple bolt cutter, 1½-in. wedge grip header, 1-in. double bolt cutter, 1½-in. double staybolt cutter; die sharpener and National electric furnace; Columbia 32-in. shaper; Rockford Milling Machine Company new type splice bar miller for reclaiming splice bars; Dreses 6-ft. radial drill; Foster No. 2B turret lathe; Chambersburg 50-ton bushing press; Wilmarth & Morman No. 1 universal grinder, double end drill grinder and No. 78 surface grinder; Cone Automatic Machine Company four-spindle turret lathe. Represented by J. M. Davis, P. M. Brotherhood, E. M. Moore, H. D. Carlton, T. S. Stephens, B. T. Williston, C. H. Graesser and F. J. Baumis. Spaces 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84 and 86.

Massachusetts Mohair Plush Company, Boston, Mass.—Bay State brand mohair car seat plush. Represented by William W. Melcher and Austin B. Mason. Spaces 635 and 637.

Matthews & Monette, Montreal, Que.—Locomotive firebox door. Represented by A. G. Griffiths. Space 310.

Metal & Thermit Corporation, New York.—Material and apparatus for locomotive welding and other welding jobs in railroad shops. Represented by W. R. Hulbert, H. D. Kelly, H. S. Mann, John H. Deppeler and R. L. Browne. Space 136.

Metal Hose & Tubing Company, Inc., Brooklyn, N. Y.—Gasoline, oil and paint spraying hose with brass fittings. Represented by J. M. Oden, R. S. Westcott and R. C. Haynes. Space 324.

Midgeley & Borrowdale, Chicago.—"Protecto" metal bound felt weatherstripping for passenger cars; Wittliff chair braces; "Chaton" all-fibre dust guards. Represented by Stanley W. Midgeley. Space 40.

Milar, Clinch & Company, Chicago, Ill.—Continental car cement; "Protex" boiler metal treatment. Represented by Karl A. Milar and Duncan L. Clinch. Space C. (Porch).

Milburn Company, The Alexander, Baltimore, Md.—Medium and low pressure acetylene welding generators for stationary shop installation and portable use; combination welding and cutting torch; pressure regulators; Wells oil lights and pre-heaters; portable carbide lights for night construction; wrecker lights. Represented by A. F. Jenkins, C. R. Pollard, E. P. Boyer and C. E. Mitchell. Space 217.

Miner, Inc., W. H., Chicago.—Friction draft gears; friction buffing devices; spring draft gears; safety hand brakes; side bearings; refrigerator car door fasteners; bolster locking center pins. Represented by W. H. Miner, W. A. Berger, A. E. Biddle, R. W. Boos, B. S. Johnson, G. A. Johnson, G. Q. Lewis, J. H. Link, J. R. Mitchell, J. F. O'Connor, W. E. Robertson, H. F. Schwartzenberg, W. H. Strafford, R. H. Weber, Keith Williams and A. P. Withall. Spaces 586 and 587.

More-Jones Brass & Metal Company, St. Louis, Mo.—"Arctic" bronze pressure chill cast locomotive crown bearings, floating rod bushings, valve packing ring castings and finished rings; semi-finished rod brasses, shoes and wedges, gibs, bushings, plugs, cocks valves and fittings. Represented by S. W. Crawford and A. Y. Evins. Space 313.

Morton Manufacturing Company, Chicago.—Acme canvas vestibule diaphragms and attachments; Russum steel diaphragms; Acme vestibule curtain outfit; Acme buffing mechanisms; Acme window curtains and fixtures; Acme car window locks, racks and weatherstripping; Kass safety treads, flights of steps, step boxes and brake steps for freight cars; Acme steel doors; Chanarch steel flooring and Acme tail gates. Represented by H. U. Morton, William M. Wampler, G. H. Ord, H. B. Chamberlain, A. Koenig, F. N. Grigg and V. Dickinson. Spaces 570 and 571.

Morton Manufacturing Company, Muskegon Heights, Mich.—Special heavy duty draw-cut railroad shaper complete with driving box planing equipment; driving box brass planing equipment; shoe and wedge planing equipment; 30-in. heavy duty rod brass shaper; Robinson automatic air hose couplings. Represented by Henry E. Morton, G. F. Goble and H. Earl Morton. Spaces 88 and 90.

Murdock Manufacturing & Supply Company, The, Cincinnati, Ohio.—Railway water service box for coach yards, terminals and cinder pits; yard hydrants; fire hydrants; anti-freezing drinking fountains. Represented by J. C. Endebrock and Kelso Murdock. Space 317.

Nathan Manufacturing Company, New York.—Locomotive injectors; boiler checks; hydrostatic and mechanical lubricators; whistles; water columns; balanced steam starting valaves; reverse gear valves; blower valves. Represented by J. F. Farrell, R. Welsh, W. R. Walsh, F. C. Davern, R. H. Jenkins, E. F. Boyle, O. Best, F. E. Marsh, W. L. Barr, D. L. Beattie, J. T. Dohm, J. E. Brandt, T. J. Murphy, L. Kassander, W. G. Lockwood, J. E. Murphy and H. K. Mask. Spaces 582 and 583.

National Boiler Washing Company of Illinois, Chicago.—Reception booth. Represented by F. A. Gale and L. G. Plant. Space 608.

National Brake Company, Inc., Buffalo, N. Y.—Peacock geared hand brakes. Represented by F. D. Miller and W. D. Brewster. Space 322.

National Car Wheel Company, Pittsburgh, Pa.—Star special chilled wheels; standard A. R. A. chilled wheels. Represented by William F. Cutler, Frank C. Turner, J. Brooks Spencer, S. C. Watkins, C. M. Bower, J. H. Yardley, H. E. McClumpha, J. Francis Weisbrod, J. Sumner Buchanam and Oliver W. Spencer. Spaces 514 and 516.

National Lead Company, New York.—Antique white lead mill; piece of Roman lead pipe; red lead and white lead color charts. Represented by F. M. Hartley, Jr. Space 363.

National Lock Washer Company, The, Newark, N. J.—Curtain fixtures and rollers; sash locks; sash lifts and balances; anti-rattlers; rib lock washers. Represented by J. Howard Horn, Daniel Hoyt, A. W. Preikschat and G. L. R. Masters. Space 543.

National Machinery Company, The, Tiffin, Ohio.—1½-in. high duty heading and forging machine in operation forging and bending grab irons; full line of bolt threading machines. Represented by E. K. Frost, F. J. Mawby, K. L. Ernst and C. D. Harmon. Space 74 and 76.

National Malleable & Steel Castings Company, Cleveland, Ohio.—Couplers; engine pockets; journal boxes; draft gears; hand brake mechanism; car door fasteners; miscellaneous railroad castings. Represented by T. W. Aishton, J. J. Byers, W. E. Coffin, G. R. Farrell, Elmer Fathauer, Charles Gaspar, J. H. Jaschka, H. T. Krakau, F. K. LeVake, W. C. Lewis, H. L. Maush, C. H. McCrea, F. E. Moffett, Benjamin Nields, Jr., George Rasmussen, E. H. Schmidt, J. A. Slater, S. L. Smith, T. H. Doyle, F. Snyder, E. O. Warner and L. S. Wright. Spaces 613 and 615.

National Railway Appliance Company, New York.—Garland ventilators; shop crane wheels; Cutler-Hammer car heaters. Represented by B. A. Hegeman, Jr., C. C. Castle, H. A. Hegeman, W. C. Peters, F. M. Richards and H. W. Kidwell. Space 622.

National Railway Devices Company, Chicago.—Shoemaker radial firedoor; Shoemaker vertical firedoor. Represented by Jay G. Robinson and E. J. Gunnison. Space E. (Porch).

National Safety Appliance Company, San Francisco, Cal.—Intermittent inductive automatic train control equipment in operation. Represented by J. P. Robinson, E. C. Wilson, E. W. Stone and H. P. Folker. Space 404.

Nazel Engineering & Machine Works, Philadelphia, Pa.—No. 3 B motor driven forging hammer. Represented by Ralph W. Nazel and J. Milton Nazel. Space 77.

Nelson Manufacturing Company, B. F., Minneapolis, Minn.—Roofing and insulating papers for buildings and cars; waterproofed cotton fabrics for refrigerator cars, bridges and subways; canvas roofing for locomotive cabs, passenger coaches, cabooses, etc. Represented by D. B. Wright and H. A. Jackson. Space 365.

New York Air Brake Company, The, New York.—Oil atomizing lubricator for air brake compressors; centrifugal air pump strainer for air brake compressors; improved type "J" pressure controller for air brake system; improved steam piston and rod assembly for air brake compressors. Represented by E. K. Conneely, C. E. Leach, N. A. Campbell, B. J. Minnier, E. F. Wentworth, George Kleifges and Charles A. Gray. Space 30.

Newport News Shipbuilding & Dry Dock Company, Newport News, Va.—Twisted side rod; cast steel driving box. Represented by J. S. Sheafe. Space, part of 223.

Niles-Bement-Pond Company, New York.—Niles new design 48-in. car wheel borer; N.B.P. 5-ft. Right Line radial drill; Pratt & Whitney new design 16-in. tool room lathe; Pratt & Whitney new design 6-in. vertical shaper; small tools and railroad gages. Represented by Edward L. Leeds, H. F. Welch, N. C. Walpole, Charles Lyle, D. H. Teas, W. S. McCormick, J. A. Ross, Paul Renno, J. J. Fisher, R. Rausch, J. L. Wood and George F. Mills. Spaces 116, 118 and 120.

Norton, Inc., A. O. Boston, Mass.—High speed ball bearing screw, self-lowering, speed control jacks of various capacities; special 35-ton journal jack. Represented by William R. Kelly, C. H. Smith, Jr., H. J. Wilson, R. D. Bates, H. A. Norton and F. L. Gormley. Space 550.

Nuttall Company, R. D., Pittsburgh, Pa.—BP hardened booster gears for steam locomotives; leaf spring type flexible gear for electric locomotives; helical gearing; miscellaneous heat treated parts; industrial gearing. Represented by Q. W. Hershey, J. E. Mullen, W. H. Phillips and R. F. Fiske. Space 94.

Ohio Machine Tool Company, The, Kenton, Ohio.—32-in. Dreadnaught shaper and attachments for machining special locomotive parts. Represented by C. C. Swift and L. H. Peters. Space 7, Arkansas Avenue Annex.

O. K. Tool Company, Inc., The, Shelton, Conn.—O. K. system of holders and tools for lathes, planers, shapers and boring mills; automatic and special machine; O. K. inserted tooth milling cutters for all uses; inserted tooth hobs for gear cutting. Represented by George W. Conklin and Frederick Schroeder. Space 161.

Okadee Company, The, Chicago, Ill.—Blow-off valves and blower valves; tender hose couplers; front end hinges; automatic cylinder cocks; automatic drain valves; water glass protectors. Represented by A. G. Hollingshead, Harry Vissering, G. S. Turner, Charles R. Long, Jr., J. M. Monroe, W. H. Heckman and J. S. Lemley. Space 576.

Okflonite Company, The, Passaic, N. J.—Okonite and varnished cambric insulated wire and cables; insulating tapes; headlight wire; Okocord; car wire. Represented by J. D. Underhill, W. R. Van Steenburgh, J. W. Hackett, H. A. Hamilton and E. A. Thornwell. Space 559.

Oldham & Son Company, George, Baltimore, Md.—Pneumatic chipping hammers, bench rammers, floor rammers, riveters, scalers, holders-on and all accessories. Represented by George J. Lynch, H. J. Bannister, N. A. Pelham, R. W. Nelson and P. J. Christy. Space 320.

Oliver Electric & Manufacturing Company, St. Louis, Mo.—Locomotive wiring fittings; classification, marker and back-up lamps; Safety First switches; plugs and receptacles; electric hand lanterns; safety portable hand lamps. Represented by J. A. Amos, William M. Graves, W. A. Ross and G. V. Wright. Spaces 508 and 510.

O'Malley-Beare Valve Company, Chicago.—Valves; journal bearings; locomotive castings. Represented by Edward O'Malley, J. E. Brown and A. W. Lemme. Spaces 538 and 540.

Oxweld Railroad Service Company, The, Chicago.—Reception booth. Represented by C. B. Moore, R. R. Browning, J. P. McWilliams, G. B. Walker, F. H. Haggerson, M. C. Beymer, J. G. Tawse, F. W. Thatcher, G. P. Bogert, G. M. Crownover, Leo Romney, F. C. Hasse, A. W. Whiteford, H. V. Gigandet, A. N. Lucas, Ross Webster, O. D. Hays, C. S. Wright, W. Williams, O. D. Falls, W. F. Lee, V. P. Kojeski, J. W. O'Neill, W. A. Hogan, H. W. Schulze, Scott Daffer, M. A. Deaton, W. A. Champieux and William Jones. Space 33.

Page Steel & Wire Company, Bridgeport, Conn.—High carbon welding material; right of way fencing; Armco gas welding rods and electrodes; panel partitions; Armco signal bond wire; steel and iron strand. Represented by W. T. Kyle, C. A. McCune and W. H. Bleecker. Space 628.

Paige & Jones Chemical Company, Inc., New York.—"Wayside Tank Methods" locomotive feed water treatment. Represented by C. B. Flint, F. O. Paige and C. E. Foyle. Space 362.

Paint Products Corporation, The, Philadelphia, Pa.—Miniature railway cars painted with "Drion" paint; panels painted with "Drion" paint. Represented by H. C. Carpenter and A. Pierce Gregg. Space 666.

Pantasote Company, Inc., The, New York.—Pantasote curtain and seating material; Russialoid upholstery material; Agasote headlining; section of a refrigerator car with new insulation material. Represented by W. A. Lake and William Anderson. Space 400.

Parkesburg Iron Company, Parkesburg, Pa.—Genuine charcoal iron locomotive boiler tubes; samples of Parkesburg iron tubes removed after long service. Represented by George Thomas, 3rd, W. H. S. Bateman, R. J. Sheridan, G. W. Denyven, J. A. Kinkead, J. R.Wetherald, S. L. Bateman, J. F. Wiese, W. P. Canby, G. H. Woodroffe and G. A. Cardwell. Space 388.

Paxton-Mitchell Company, The, Omaha, Nebr.—Metallic piston rod and valve stem packing; hand power lathe for boring metallic packing. Represented by E. L. Chollman, H. J. Molloy, L. J. McConnell and W. S. Murrian. Space 535.

Peerless Machine Company, Racine, Wis.—6-in. by 6-in. universal shaping saw; 13-in. by 13-in. universal shaping saw; 13-in. by 16-in. high speed gap saw. Represented by H. J. Swanson, A. H. Goetz, I. M. Ward and R. W. Hansen. Space 200.

Pels & Co., Inc., Henry, New York.—Combination punch, plate shear, bar, angle, beam and channel cutter; triple combined punch with high throat, splitting shear, bar, angle and tee cutter; bending and straightening machine for beams, channels, angles, etc.; gate shear for 80-in. by ¾-in. plate; coping machine. Represented by T. C. Sternblad, C. L. Lapp, Charles Rapp, William H. Thorbahn, F. Mead, William K. Stamets, A. W. Bissell and C. Seifreat. Spaces 122, 124, 126 and 128.

Penn Iron & Steel Company, Creighton, Pa.—Staybolt iron; engine bolt iron; high grade double refined iron. Represented by W. H. S. Bateman, Edward Laterman and Clinton E. Hobbs. Space 552.

Pilliod Company, The, New York.—Baker locomotive valve gear. Represented by R. H. Weatherly, H. B. Snyder, J. D. Purdy, J. J. Donovan, William McGee and H. A. Kibby. Spaces 560 and 561.

Pilot Packing Company, Inc., Chicago.—Pilot packing for air pumps, throttle stems, steam hammers, etc.; Pilot asbestos listing; Ripken automatic steam drifting valve. Represented by Joseph Sinkler and Robert Sinkler. Space 542.

Pittsburgh Steel Foundry Company, Pittsburgh, Pa.—Reception booth. Represented by E. R. Williams, John Allison, H. V. Seth, J. R. Forney and J. F. Leonard. Space 376.

Pittsburgh Testing Laboratory, Pittsburgh, Pa.—Machine for testing cement in compression; projected views showing railway equipment, bridges, buildings, reinforced concrete structures, concrete and bituminous highways, pumping machinery, high pressure valves, pipe, steel castings, etc., inspected by the Pittsburgh Testing Laboratory. Represented by Col. J. Milliken, F. V. Green, F. S. Robbins and H. M. Wey. Space 3.

Pocket List of Railroad Officials, The, New York.—Pocket List of Railroad Officials. Represented by J. Alexander Brown, Harold A. Brown and B. J. Wilson. Space 5.

Potter & Johnston Machine Company, Pawtucket, R. I.—6-C automatic chucking and turning machine. Represented by Norman R. Earle, Walter H. Foster and H. L. Kenah. Space 91.

Pratt & Lambert, Inc., Buffalo, N. Y.—Vitralite railway enamel system. Represented by J. P. Gowing, E. L. Georger and S. S. Demarest. Space 521.

Pratt & Whitney Company, New York.—See Niles-Bement-Pond Company. Spaces 116, 118 and 120.

Premier Staybolt Company, The, Pittsburgh, Pa.—Locomotive boiler staybolts. Represented by H. T. Frauenheim, J. F. McGann, L. Finegan, L. W. Widmeier. Space 302.

Pressed Steel Car Company, New York.—Reception booth; photographs. Represented by N. S. Reeder, J. F. MacEnulty, C. E. Postlethwaite, F. O. Schramm, J. S. Turner, W. H. Wilkinson, H. S. Hammond, J. G. Morrissey, C. C. Clark, F. H. Freshwater, H. H. Gilbert, F. L. Johnson, C. H. Jackman, C. P. Mapp, J. H. Regan and M. C. Blest. Spaces 545 and 601.

Princeton Foundry & Supply Company, Princeton, W. Va.—"Perfection" cone stove sand-drier; "Halls" improved shaker grates for stationary boilers. Represented by C. J. Hilty. Spaces 163 and 164.

Production Machine Company, Greenfield, Mass.—Grinding and polishing machinery; friction clutches. Represented by A. H. Behnke and B. A. Wheeler. Spaces 105 and 107.

Pyle-National Company, The, Chicago.—Sheet metal headlight cases with glass reflectors; cast aluminum alloy and cast iron headlight cases with glass reflectors; hermetically sealed 16-gage copper silver plated reflector headlight cases; Models "A" and "B" Young valve gears; train control turbo-generators; turbo-alternator turbo-generators; turbo-alternators for locomotive headlighting; flood lights; back-up lamps; connectors; train lighting turbo-generators. Represented by J. Will Johnson, William Miller, Crawford P. McGinnis, L. H. Vilas, George E. Haas, R. L. Kilker, W. T. Bretherton, C. S. Geis, P. S. Westcott, J. L. Reese, Walter Smith, Fred Kersten and Thomas P. McGinnis. Spaces 602, 604 and 606.

Q. & C. Company, The, New York.—Roller side bearings; universal emergency knuckle; Gilman-Brown emergency knuckle; piston and lubricators; engine and car replacers. Represented by F. F. Kister, E. R. Packer, R. B. Quincy, E. M. Smith, L. T. Burwell, E. C. Zimmerman, R. J. McComb and J. L. Terry. Space 630.

Racine Tool & Machine Company, Racine, Wis.—Racine high speed metal cutting machines, 4-in., 6-in. and 12-in. capacity, motor driven; Racine Duplex band saw machines for cutting wood, soft and hard metals. Represented by Thomas A. Hyde and William Reinhardt. Space 156.

Railroad Herald, The, Atlanta, Ga.—The Railroad Herald. Represented by E. C. Laird. Space 213.

Railway Devices Company, St. Louis, Mo.—"Western" angle cock and air brake pipe holder; "Perfection" brake ratchet; "Real" brake jaws; "Sta-Rite" coupler release; "Spiral" pipe clamps. Represented by Louis A. Hoerr, Roland M. Hoerr and Sterling Campbell. Space 618.

Railway Purchases and Stores, Chicago.—Railway Purchases and Stores. Represented by Edward Wray and H. B. Kirkland. Space 18.

Railway Review Chicago.—Railway Review. Represented by Harold A. Smith, C. L. Bates, J. E. Gougeon, C. H. Gertner, J. A. Walsh, L. R. Wolff, Enoch Nilsson and William W. Baxter. Spaces 12 and 14.

Railway Storage Battery Car Company, New York.—Model battery car; photographs of cars in service; reception booth. Represented by L. Klopman and F. N. Koziell. Space 634.

Ralston Steel Car Company, The, Columbus, Ohio.—Reception booth. Represented by F. E. Symons, F. A. Livingston, B. C. Hanna, William Alexander, C. L. Fox, C. O. Rea and F. M. Cowgill. Space 558.

Remington Typewriter Company, New York.—Accounting machine for M. C. B. billing; noiseless typewriter; "Quiet 12" typewriter; portable typewriter; complimentary letter service. Represented by A. T. Rose, J. E. McKerracher, H. L. Hedlund and H. W. Buse. Space 4-A.

Republic Iron & Steel Company, Youngstown, Ohio.—Reception booth. Represented by W. B. Topping, W. H. Oliver, C. S. McKinley and J. K. Garretson. Space 517.

Rice Manufacturing Company, Indianapolis, Ind.—Red Devil rivet cutter. Represented by A. G. Rice. Space 169.

Rivet Cutting Gun Company, Cincinnati, Ohio.—Cincinnati rivet cutting gun; Cincinnati concrete digger; safety first appliances. Represented by J. M. Crowe and L. K. DeBus. Space 513.

Roberts Automatic Connector Company, Ltd., Sarnia, Ont.—Automatic steam and air connector for train service. Represented by John W. Roberts, Thomas H. Robinson and W. E. Saylor. Spaces 171 and 172.

Robinson & Co., Inc., Dwight P., New York.—Photographs. Represented by R. M. Henderson, H. H. Kerr, F. H. McGraw, R. A. Marshall and C. E. Harris. Space 328.

Roebling's Sons Company, John A., Trenton, N. J.—Wire and wire rope, wire rope fittings and slings, bell and signal cord; alligator wrenches, insulated wires and cables; wire cloth; copper and steel telegraph wire; welding wire; bond wires; type "A" rail bond; moving pictures. Represented by Horace E. Thorn, Arthur E. Gaynor, J. Lewis Unsworth, Archibald L. Miller, Edward V. Bertram, John W. Whelan, Harold J. Horn, J. Fennell Berger, J. Raymond Jones, Arthur Watts, John E. Nolan and Gideon W. Swan. Space 145.

Rogatchoff Company, The, Baltimore, Md.—Adjustable crossheads and piston bull rings. Represented by Theodore Rogatchoff and Charles N. Winter. Space 359.

Rome Iron Mills, Inc., New York.—Samples of staybolt iron. Represented by B. A. Clements and C. C. Osterhout. Spaces 402, 414, 416, 422 and 424.

Rubberset Company, Newark, N. J.—Complete line of Rubberset paint brushes. Represented by A. L. Holtzman. Space 11.

Safety Car Heating & Lighting Company, The, New Haven, Conn.—"Under-Frame" axle lighting equipment; "Putnam" storage battery; car lighting fixtures; electric fans; Pintsch gas lighting equipment; electric water heater; electric water cooler. Represented by W. L. Conwell, W. L. Garland, J. H. Rodger, J. S. Henry, S. I. Hopkins, H. D. Donnell, A. B. Mills, R. H. Harvey, H. K. Williams, G. A. Scott, J. L. Hays, C. W. T. Stuart, George E. Hulse, L. Schepmoes and A. V. Livingston. Space on stairway platform, Aquarium Court.

Safety Equipment Service Company, The, Cleveland, Ohio.—Safety goggles, asbestos gloves, leggings and clothing; safety and danger signs; welding goggles and helmets; insulated tools; electricians' gloves; first aid cabinets; gas masks; respirators; machine guards; ladder shoes; hopper car wrench; car movers. Represented by B. W. Nutt and H. L. Wood. Space 665.

Sargent Company, Chicago, Ill.—Imperial safety sight feed lubricator; Loedige quick acting blower valve; Sargent two-seat gage cocks; Sargent three-face safety water gage; safety water glass gaskets; water column. Represented by George H. Sargent and Louis L. Schultz. Space 600.

Schaefer Equipment Company, Pittsburgh, Pa.—Drop forged brake hangers, truck levers, truck lever connections and brake rod jaws. Represented by F. A. Barbey, T. F. Dwyer, Jr., W. E. Cade, Jr., H. G. Doran, S. M. Hindman, J. C. Little, Frederic Schaefer and E. J. Searles. Space 511.

Schroeder Tool Company, Altoona, Pa.—Turning tools for locomotive driving wheels; steel car wheels and car axles; planer and shaper tools. Represented by F. J. Schroeder and G. A. Barden. Space, part of 375.

Scullin Steel Company, St. Louis, Mo.—Car truck; locomotive driving wheel; rolling mill products. Represented by F. L. Norton, G. L. L. Davis, V. C. Turner, H. E. Doerr, R. C. Ferguson, E. Worthan, P. J. McCullough and G. S. Chiles. Space 228.

Scully Steel & Iron Company, Chicago.—Draper flue welding machine, Campbell nibbling machine; tube expanders and cutters; reversible staybolt chucks; staybolt headers; flaring tools; boilermakers' clamps; expansion reamers. Represented by J. W. Patterson and A. D. F. Simmons. Space 662.

Sellers & Company, Inc., William, Philadelphia, Pa.—Locomotive injectors and accessories. Represented by Edward L. Holljes, John D. McClintock, James R. New, Phillip E. Raymond and Charles T. Wilson. Space 627.

Sheafe Engineering Company, Chicago, Ill.—Bubb locomotive cylinder lubricator; Bubb steam end air pump lubricator; Bubb stoker engine lubricator; air brake hose couplings; locomotive wedge supporting shim or block; twisted locomotive side rod of electric steel, manufactured by the Newport News Shipbuilding & Dry Dock Company. Represented by J. S. Sheafe and Harold Pearson. Space 223.

Sherwin-Williams Company, The, Cleveland, Ohio.—Reception booth. Represented by F. A. Elmquist, G. A. Dorward, J. Schlintz, A. H. Kennedy and C. R. Jarden. Space 19.

Simmons-Boardman Publishing Company, New York.—Railway Age; Railway Mechanical Engineer; Railway Engineering and Maintenance; Railway Signaling; Railway Electrical Engineer; Marine Engineering and Shipping Age; The Boiler Maker; Car Builders' Cyclopedia; Locomotive Cyclopedia; Maintenance of Way Cyclopedia; books on transportation subjects. Represented by E. A. Simmons, S. O. Dunn, R. V. Wright, C. B. Peck, E. L. Woodward, M. B. Richardson, L. R. Gurley, H. C. Wilcox, M. Moore, A. G. Oehler, C. J. Corse, F. W. Lane, R. C. Augur, H. P. Foster, A. E. Ortlinghaus, E. A. Rehm, L. B. Sherman, Henry Lee, George Slate, C. R. Mills, F. H. Thompson, J. G. Little, F. C. Koch, J. M. Rutherford, R. E. Thayer, I. E. Anderson, R. F. Duysters, G. W. Daves, H. B. Bolander, J. A. Miller, P. Traeger, R. F. Parisen, A. Goodbeck, J. E. Taylor and R. S. Mennie. Space 1.

Sine & Co., James B., Bridgeville, Pa.—Painted panels. Represented by R. E. Rogers, R. M. Smith and Milton Davis. Space G. (Porch).

S. K. F. Industries, New York.—Skavef self-alining ball and roller bearings; Hess-Bright deep-groove radial bearings; Atlas steel balls; models showing anti-friction qualities of ball bearings; self-alining roller bearing journal boxes for miscellaneous railway equipment. Represented by W. L. Batt, S. B. Taylor, R. H. DeMott, H. E. Brunner, Harry Allen, J. Tawresy and R. C. Byler. Space 147.

Skinner Chuck Company, The, New Britain, Conn.—Lathe chucks; face plate jaws; drill press vises; milling machine vises; planer chucks; drill chucks. Represented by A. A. North and A. E. Thornton. Space 140.

Skybrite Company, The, Cleveland, Ohio.—Skybrite liquid and powder window cleaning compounds; Skyco No-Glare light diffusive window coating. Represented by T. T. Holt, J. N. Gordon and F. W. Christman. Space 656.

Smith Locomotive Adjustable Hub Plate Company, The, Chicago.—Smith adjustable hub plates for locomotives. Represented by Albert J. Sams. Space E. (Porch).

Snyder & Son Company, J. E., Worcester, Mass.—36-in. sliding head vertical drilling machine equipped with tapping attachment. Represented by Milton C. Snyder. Space 70.

Southern Wheel Company, Pittsburgh, Pa.—See National Car Wheel Company. Spaces 514 and 516.

Southwark Foundry & Machine Company, Philadelphia, Pa.—Scale test cars; punches and shears; sheet and plate profiling machines; spring machinery; washer presses; bushing presses. Represented by W. H. Harman, F. G. Schrann and G. H. Case. Space 135.

Springfield Machine Tool Company, The, Springfield, Ohio.—14-in. by 6-ft. motor driven portable lathe. Represented by Edward S. Montanus and Paul A. Montaus. Space 70.

Stafford Roller Bearing Car Truck Corporation, Lawton, Mich.—Journal roller bearing assemblies; end thrust bearing assemblies; roller bearing journal boxes complete for rolling stock and motive power journals. Represented by Leo K. Stafford and Oscar F. Packer. Space 168.

Standard Car Truck Company, Chicago.—Models of specially designed freight trucks and side bearings; full size working parts of various devices. Represented by Lee W. Barber, James T. Milner, F. L. Barber and E. W. Webb. Space 512.

Standard Coupler Company, New York.—Sessions-Standard friction draft gears, types "K-4" and "Jumbo No. 2;" Goodwin self-spotting roller side bearing. Represented by Douglas J. McKay, E. G. Goodwin, W. Eckels, E. F. Pride, A. D. Morrow and H. Bogdanovich. Space 500.

Standard Railway Equipment Company, Chicago.—Rigid steel roofs; flexible steel roof; carlines; steel ends; release rigging; centering device; doors; Fowler springs. Represented by W. P. Murphy, Albert Murphy, A. A. Frank, S. G. Rea, George T. Cook, G. G. Gilpin, J. T. Cralley and A. S. Merz. Spaces 426 and 428.

Standard Steel Works Company, Philadelphia, Pa.—Moving picture showing manufacture of steel tires, steel wheels, steel forgings, and steel castings. Represented by Richard Sanderson and Frank K. Metzger. Space 625.

Standard Stoker Company, Inc., New York.—DuPont-Simplex stoker. Represented by W. A. Larner, H. C. Oviatt, A. M. Hunt, F. C. Pickard, F. P. Roesch, C. H. Peterson and R. C. Shaal. Space 232.

Starrett Company, The L. S., Athol, Mass.—Mechanical tools; hack saw blades; steel tapes and vises. Represented by D. Findlay, A. H. Starrett and D. Moffat. Space 364.

Stewart Manufacturing Corporation, Chicago.—Metallic packing rings for piston rods and valve stems; bearing metals and bushings. Represented by George C. Jerome and H. C. Snyder. Space 222.

Stucki Company, A., Pittsburgh, Pa.—Side bearing taken from 100-ton car after eight years' service; 50-ton U. S. R. A. side bearing; all high carbon steel side bearing simplified to two pieces. Represented by A. Stucki, A. B. Severn and W. C. Hansen. Space 539.

Sun Oil Company, Philadelphia, Pa.—Parts machined with Sunoco emulsifying cutting oils. Represented by R. S. Drysdale, E. Morrison, C. K. Hague and E. Allansby. Space 654.

Sunbeam Electric Manufacturing Company, Evansville, Ind.—Type RE-3 turbo-generator; airtight headlights; glass reflector headlights; headlight accessories. Represented by F. W. Edmunds, H. A. Varney, J. Henry Schroeder and W. T. Manogue. Spaces 321 and 323.

Superior Steel Castings Company, Chicago.—See Midgley & Borrowdale. Space 40.

Superheater Company, The, New York.—Model of feed water heater; model exhaust steam injector; model Scotch marine boiler with superheater installed; model stationary superheater; pyrometer. Represented by George L. Bourne, F. A. Schaff, R. M. Ostermann, G. E. Ryder, H. B. Oatley, C. H. True, A. C. Louden, N. T. McKee, R. R. Porterfield, C. A. Brandt, Bard Browne, W. A. Buckbee, A. C. McLachlan, George Fogg, George L. Dolan, John Mourne, K. E. Stilwell, E. A. Averill, H. V. Jones, B. N. Broido, J. C. Scott, C. A. Odell, L. A. H. Weaver, J. H. Birmingham. Space 422.

Swind Machinery Company, Philadelphia, Pa.—No. 121 Baker drill; 36-in. by 36-in. by 10-ft. Gray maximum service planer; 26-in. by 12-ft. Bradford geared head lathe; 32-in Cincinnati "Climax" shaper. Represented by L. H. Swind, W. J. Powers, R. W. Burk and G. Helling. Space 75.

Symington Company, The T. H., New York.—Farlow draft gear attachments; Symington swivel butt coupler; malleable iron freight, passenger and tender truck journal boxes; pressed steel side frame. Represented by C. J. Symington, R. H. Gwaltney, Hynes Sparks, LeRoy Kramer, C. R. Naylor, I. O. Wright, H. W. White, Jr., B. W. Jones, T. R. Symington, G. B. Pettingill and D. S. Barrows. Spaces 572 and 573.

Talmage Manufacturing Company, The, Cleveland, Ohio.—Ash pan and ash pan cleaner; boiler cleaner; "Improved" Cleveland low water alarm; drifting valves; hand brake. Represented by Frank M. Roby, H. B. Thurston and D. B. Parker. Spaces 354, 355, 356 and 357.

Templeton, Kenly & Co., Ltd., Chicago.—Simplex car jacks that have been in railroad service for years, with facilities for determining their wear. Represented by C. A. Crane, Jr., J. L. Crowley, George L. Mayer and W. B. Templeton. Space, 334.

Thomson Electric Welding Company, Lynn, Mass.—Model 20-A-122 flue welder; model 50 S. P. flue welder; Marshalltown Manufacturing Company flue roller. Represented by Harold B. Warren, Freeland H. Leslie, Maurice G. Littlefield, Russell S. Donald, George L. Lind and Roy M. Taylor. Spaces 702 and 703.

Timken Roller Bearing Company, Canton, Ohio.—Tapered roller bearings for use in industrial appliances; bus axles; railway and mine car axles; electric motors; line shaft hangers. Represented by H. H. Gildner, Earl Beatty, E. R. Phillips and W. C. Sanders. Space 138.

Torchweld Equipment Company, Chicago.—Welding and cutting apparatus. Represented by W. A. Slack. Space, part of 18.

Transportation Devices Corporation, Indianapolis, Ind.—Locomotive automatic cut-off control and power reverse gear. Represented by W. C. Miner, W. R. Beck and F. H. Lutz. Space 332.

Tuco Products Corporation, New York.—Tuco National standard roofing; trap doors; Flexolith, Tuco preservative; Tucork; Rockwul jacket; Resisto; screens. Represented by David W. Pye, F. N. Grigg, J. W. Coleman, T. L. Miller, R. F. O'Leary and E. J. Corcoran. Space 629.

Underwood Corporation, H. B., Philadelphia, Pa.—Locomotive cylinder and valve chamber boring bar; boring bar for air compressor, stoker engine, power reverse gears and water pump cylinders; portable crank pin turning machines; valve seat rotary planer; locomotive cylinder or dome facing machine. Represented by Christopher Noller and F. H. Schonberger. Spaces 379 and 381.

Union Asbestos & Rubber Company, Chicago.—Packings and asbestos materials for locomotive and power plant use; asbestos flexible boiler lagging; "Insutape" pipe covering for steam pipes in and out of locomotive cabs; "Insubestos" passenger car insulation; waterproofing materials for refrigerator cars. Represented by L. L. Cohen, J. H. Kuhns, W. R. Gillies and G. A. Hull. Space 202.

Union Draft Gear Company, Chicago.—Cardwell friction draft gear type G, Class 11-A; type G, class 25-A; type G, class 11-A Duplex. Represented by J. R. Cardwell, L. T. Canfield, H. Barnard, W. G. Krauser, J. E. Tarelton, C. J. Gorman, F. E. Schmitz, J. A. King, C. A. Danielson, J. W. Bridge and O. C. Heckart. Spaces 413 and 415.

Union Metal Products Company, Chicago.—See Standard Railway Equipment Company.

Union Railway Equipment Company, Chicago.—"Uredo" coupler release rigging; coupler centering device; metal ladders; pressed steel well trap; refrigerator self-locking door hinges; brine tank equipment; Hi-Powered geared drop brake; stationary geared brake; drop brake shaft without gears; drop handle ratchet brake. Represented by W. B. Hall, A. F. O'Connor and George E. Coffey. Space 226.

Union Spring & Manufacturing Company, Pittsburgh, Pa.—Reception booth. Represented by L. G. Woods, D. R. Warfield, N. S. Kenny, F. E. Schaeffer, A. C. Woods, W. L. Jefferies, Jr., H. C. Bughman, Jr., and J. W. Chandler. Space 551.

United Alloy Steel Corporation, Canton, Ohio.—Alloy and carbon steel connecting rods; "Toncan" boiler tubes, staybolts and passenger car flooring; alloy and carbon steel springs; molybdenum and nickel steel shovels; samples of stainless steel and iron. Represented by A. L. Roberts, A. S. Taylor and J. G. Bell. Space 369.

United Manufacturing & Sales Corporation, The, Denver, Colo.—Swanson automatic flange lubricators; air pump piston swab nut lock; steam and air gage holder. Represented by O. W. Swanson, A. T. Arthur, R. W. Burnett and F. C. Reed. Space 219.

U. S. Light & Heat Corporation, Niagara Falls, N. Y.—4-kw. car lighting equipment complete with panel; lamp regulator in operation with diverter generator and 16-cell battery; 200-ampere electric arc welder in operation; lamp regulator with diverter; automatic switch which has opened and closed a million times without failure. Represented by W. L. Biles, H. A. Matthews, E. Bauer, O. R. Hildebrant, H. A. Morrison and R. Desmond. Space 143.

U. S. Metallic Packing Company, The, Philadelphia, Pa.—King metallic packing for piston rods, valve stems and air pumps; King sanders; King oil cups; Security shaker bar; King hand boring lathe. Represented by Elliott Curtiss, J. T. Luscombe, J. S. Mace, D. C. Thomas, R. A. Light, H. E. Hyslop, L. B. Miller and J. C. Weedon. Spaces 568 and 569.

United States Rubber Company, New York.—Train lighting hard rubber battery jars and accessories. Represented by George A. Gardner, L. S. Hungerford, Jr., F. E. Dodson, A. B. Means and R. B. Smith. Space 7.

Universal Draft Gear Attachment Company, Chicago.—Cast steel draft arms; cast steel coupler yokes ;hand brake attachments; ratchet lever brake; release rigging; draft lugs. Represented by C. J. Nash, C. C. Kinsman, H. I. Wrigley and P. B. Camp. Space 515.

Universal Machine & Tool Company, Canton, Ohio.—Universal open side shaper. Represented by J, E. Lehman and M. F. Weida. Space 157.

Universal Packing Corporation, Pittsburgh, Pa.—Durametallic locomotive packing; Homestead blow-off cocks and other valves. Represented by Alfred S. Osbourne, A. M. Donnan, J. J. McQuillen, J. M. Bandish and H. M. Lewis. Space 327.

Universal Packing & Service Company, Chicago.—Spring journal box packing; I-D type service metal gage; A. R. A. type steel wheel gage. Represented by J. P. Landreth, G. H. Green, W. H. Davis, T. P. Williams and J. D. Herr. Space 541.

Vanadium-Alloys Steel Company, Latrobe, Pa.—High speed, alloy and carbon tool steels; fractures of these steels showing results of various heat treatments; used and new tools showing uses of tool steel in railroad work. Represented by W. S. Jones, J. P. Gill, L. D. Bowman, J. H. Roberts, W. R. Mau, R. R. Artz, F. W. Potts and W. S. Dunlap. Space 300.

Vanadium Corporation of America, New York.—Ferro Vanadium. Represented by M. G. Baker, G. L. Norris and J. A. Miller, Jr. Space 5.

Vapor Car Heating Company, Inc., Chicago.—Passenger car heating equipment; automatic temperature control heating systems; flexible metallic conduits; vertical radiators; car heating fittings; locomotive pressure reducing valves; locomotive specialties for car heating. Represented by E. H. Gold, J. E. Buker, H. F. Lowman, N. F. Burns, L. H. Gillick, L. B. Rhodes and P. B. Parks. Spaces 210, 212, 214 and 216.

Vissering & Co., Harry, Chicago.—"Viloco" and "Leach type" sanders; "Viloco" bell ringers; "Viloco" grease lubricators; "Crescent" metallic packing; "Viloco" brake steps. Represented by Harry Vissering, Charles R. Long, Jr., G. S. Turner, W. H. Heckman, J. M. Monroe and J. S. Lemley. Space 576.

Walker Draft Gear Corporation, New York.—New friction draft gear. Represented by Edmund H. Walker. Space 544.

Walker, L. S. & E. H., New York.—"Walker" standard A. R. A. cast steel journal boxes and miscellaneous steel castings made in France; specimens of timber after actual service, treated with the wood preservative "Wolman Salts." Represented by L. S. Walker and Sherman Jenney. Space 165.

Walworth Manufacturing Company, Boston, Mass.—Valves, fittings and tools for steam, water, gas, oil and air, including genuine Walworth Stillson wrench; exhibit showing how the Walworth Kewanee union is made, beginning with the raw material; automatic slide machine showing comedy "How the Handy Helper Helped Henry." Represented by L. F. Hamilton, P. W. Miller, W. J. Moran and E. S. Rawson, Jr. Space 412.

Warner & Swasey Company, Cleveland, Ohio.—Turret lathe. Represented by A. C. Cook, G. E. Gardner, G. Kochenderfer, W. Leogler, H. Bailey and J. A. Craig. Space 109.

Waynesboro Nut Lock Company, Waynesboro, Pa.—Section of rail joint; nut lock application on large model rail. Represented by O. M. Peters, Oscar Eurich and G. B. Shively. Space 380.

West Disinfecting Company, New York.—Disinfectants; sanitary Appliances; paper towels; cabinets. Represented by H. E. Daniels, C. P. Williams, E. C. Daniels and S. H. Flannagan. Space 26.

Western Railway Equipment Company, St. Louis, Mo.—"A. R. A. Standard-Plus" journal wedges. Represented by Louis A. Hoerr, Roland M. Hoerr and Sterling Campbell. Space 618.

Western Steel Car & Foundry Company, New York.—See Pressed Steel Car Company.

Westinghouse Air Brake Company, Wilmerding, Pa.—Empty and load freight brake equipment; type "N" friction draft gear; Wabco brake cylinder packing cups; improved form of flange pipe union fittings for detached freight brake equipment. Represented by S. G. Down, G. W. Wildin, C. C. Farmer, C. J. Olmstead, C. H. Beck, Robert Burgess, H. S. Clark, C. R. Ellicott, J. B. Wright, R. W. Williams, C. D. Foltz, J. S. Siegrist and E. W. Davis. Space 100.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.—Industrial motor display; Pennsylvania Railroad electric locomotive; lighting plant; arc welding outfit; safety switches; Micarta gears; lightning arrestors; locomotive lighter unit; safety panel boards. Represented by P. H. Grunnagle, H. H. Lupinski, A. J. Manson, C. R. Jones, H. H. Wentworth, Troy Russell, C. C. Bawden, B. L. Clegg, C. R. Clark, Cecil Gray, A. S. Wentworth, C. A. Bercaw, R. J. Ross, Thomas Cooper, J. R. Sloan, A. P. Shrader, S. T. Hickling, R. H. Kilner, C. M. Harris, Mark Dawson, J. M. Curtin, W. M. Reddie, C. D. Pences, A. M. Jones, L. E. Lynde, A. McIver, L. C. Paul, J. C. McQuiston, L. F. Brahmer, George W. Brown, F. H. Shepard, A. L. Harvey, A. M. Candy, A. N. MacFarland, Paul Orr, H. K. Smith, N. W. Storer, F. E. Wynn, T. C. Whittaker, H. A. Houston, S. D. Cooper and J. V. Dolson. Spaces 23, 25, 27, 29, 96, 98 and 100 and on exhibit track.

Wheel Truing Brake Shoe Company, Detroit, Mich.—Abrasive brake shoes for locomotives and car wheels. Represented by J. M. Griffin and F. F. Griffin. Space 507.

Wheeling Corrugating Company, Wheeling, W. Va.—Truss-plate car flooring. Represented by Allen Gibbons and C. H. Rollason. Space, part of A and B.

White American Locomotive Sander Company, Inc., Roanoke, Va.—Graham-White locomotive sanders, and operating valves; sand spreaders for moving sand from center of sand box to the outlets from the box to the sanders; automatic lubricator for cross-compound air pump; automatic sander for booster engines and electrics. Represented by James Franz and W. L. Ranson. Space 209.

Whiting Corporation, Harvey, Ill.—Portable car hoist; locomotive hoist parts; model of electric crane trolley; model of locomotive jack; drawings; photographs. Represented by R. H. Bourne and L. Richardson. Space 215.

Willard Storage Battery Company, Cleveland, Ohio.—Several types of train lighting batteries; parts; train control batteries; signal floating battery type; telegraph and telephone floating battery type; radio and broadcasting station battery types. Represented by Louis Sears, C. E. Murray, E. B. Reeser, M. J. Brennan and L. G. Baldwin. Space 366.

Williams Tool Corporation, Erie, Pa.—New 6-in. Hi-Production pipe threading, cutting-off and reaming machine; new 6-in. Hi-Production die heads for pipe; new portable power pipe threading machine for enginehouse, car repair shops and locomotive repair shops. Represented by Leslie S. Hall, Leslie H. Taylor and Roy H. Bayard. Space 130.

Wilson-Imperial Company, Newark, N. J.—Cleaning materials for exterior and interior of passenger equipment, including compounds for cleaning plush, curtains, cane seats, etc. Represented by D. J. Giles, Frank Sheritt, C. A. Beamont and E. M. Wilson. Space 312.

Wine Railway Appliance Company, The, Toledo, Ohio.—Wine door lock application to hopper and gondola doors; side bearings; end and side door ventilators; ladders. Represented by William E. Wine, R. F. Tillman, W. F. Cremean, Peter P. Beck and Cyrus J. Holland. Space 611.

Wood Iron & Steel Company, Alan, Philadelphia, Pa.—Gear case made from "AW" deep drawing steel; miscellaneous small articles made from "AW" stamping steel; oxygen cylinder made from "AW" alloy steel; car steps and apron plates for locomotives made from "AW" Diamond floor plates; "AW" Diamond pattern rolled steel traffic tread for wooden floor bridges. Represented by Frank C. Carter and J. R. Jones, Jr. Space 9.

Woods & Co., Edwin S., Chicago.—Roller side and center bearings; Swing Rolling Truck Company's lateral motion device. Represented by Albert G. Welch, E. G. Jackson, W. J. Hyman, W. B. Ross, H. M. Perry and G. S. Crawford. Space 619.

Worthington Pump & Machinery Corporation, New York.—Locomotive feed-water heater and boiler feed pump, sectionalized. Represented by T. C. McBride, J. M. Lammedee, J. E. Buckingham, Paul B. Fenlon, W. W. Hoit and D. R. Coleman. Spaces 13 and 15.

Wright Manufacturing Company, Lisbon, Ohio.—Chain hoists; trolleys. Represented by C. F. Wright, W. J. Ryan, S. S. Woodworth and R. F. Straw. Space 319.

Wyoming Shovel Works, The, Wyoming, Pa.—Red Edge scoops. Represented by H. T. Potter, N. E. Brooks, Stanley H. Smith, E. L. Ruby and W. C. Wright. Space 211.

Zapon Leather Cloth Company, New York.—Leather cloth for upholstering, vestibule curtains and window shades; vestibule curtain and window shade material on standard size equipment. Represented by J. LeCompte Ford, W. C. Chapman and W. M. Lalor. Space 307.

Yale & Towne Manufacturing Company, The, Stamford, Conn.—Elevating platform truck, model K-22; three-wheel tractor truck, model K-24, tracking trailer, model C-6-36; cut open drive unit; cut open hoist unit; Yale controller; miniature tractor-trailer train; roller bearing I-beam trolley; Yale chain blocks; current collectors; electric chain hoist; railroad coach door fitted with Yale door closer and door closer parts; padlocks; latches; dead locks; guard locks. Represented by Charles W. Beaver, J. G. Morgan, R. W. Chandler, R. L. Higgins, C. H. Moeller, W. F. Randall, H. A White, S. W. Gibb and H. A. Butler. Spaces 104 and 106.